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A Periodical Devoted to the Manufacture and Use of Composition Products

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Molded Products

See Page 213



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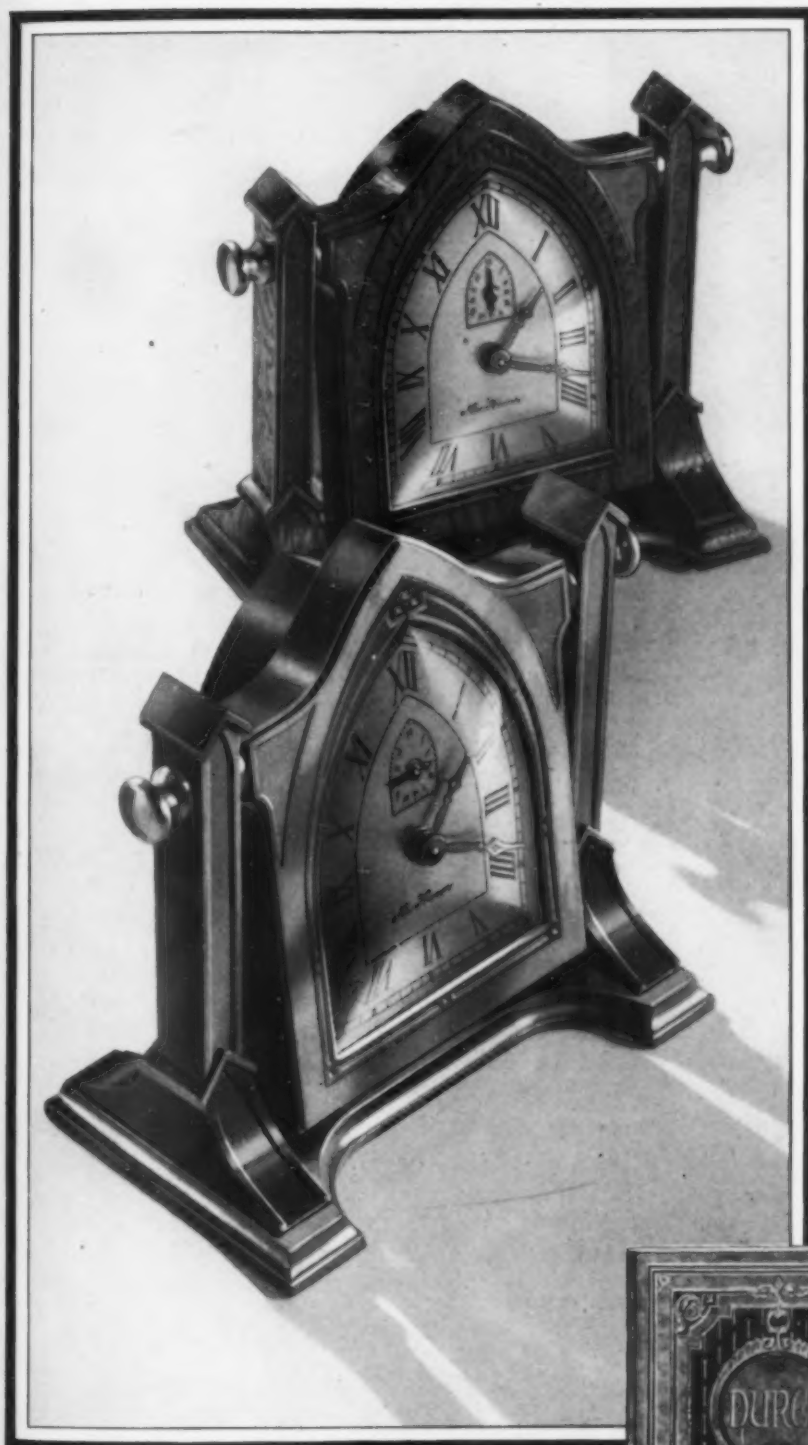
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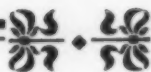
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PLASTICS & MOLDED PRODUCTS

A periodical devoted to the manufacture and use of plastic and composition products

Vol. 4

APRIL, 1928

No. 4

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Offices: 114 E. 32nd St., New York. Telephones: Ashland 6280, 6281

SYLVAN HOFFMAN, Publisher

ALAN COHEN, Adv. Director

E. D. Sheriffs, Chicago Representative

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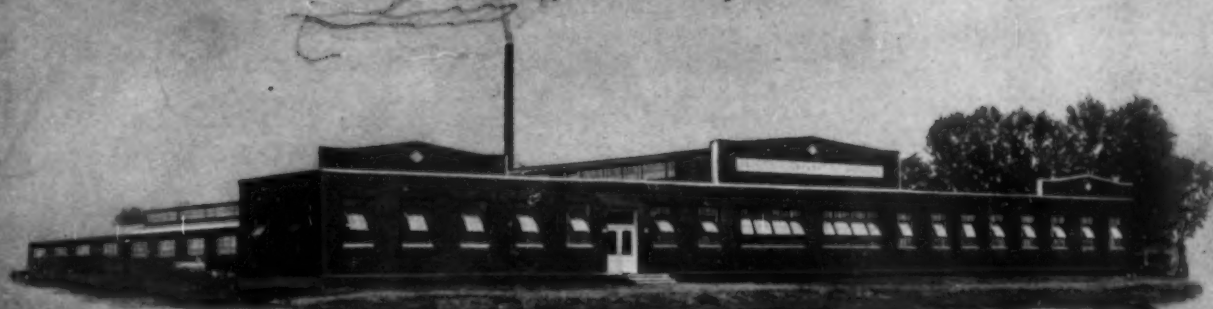
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PLASTICS

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Vol. 4

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Mechanical Properties of Plastics

Differences in structure of the various products is explained, using the modern casein solids as examples

By O. Manfred and J. Obrist

A communication from the Physical Institute of the German Technical High School at Brunn

IN the first of the present series of articles, *Plastics*, March 1928, p. 131, the plastifying effect of the work of the various types of extrusion presses was taken up. However, several other methods are known and used for the production of casein solids.

One process, used in the production of *Neolith*, employs heavy rolls on which the casein is worked somewhat like rubber when the same is sheeted. The product leaves these rolls in the form of fairly thick sheets, termed "pelts," and these are then hydraulically compressed into plates.

Block Pressed Objects

A somewhat analogous method, at least as far as the degree of plastification is concerned, is the block-pressing method. In this case somewhat thicker felted masses of casein are produced on rolls, and these are then consolidated into a large block on heavy hydraulic presses. The desired sheets are afterwards produced from these blocks by cutting.

The lowest degree of plastification of casein solids is that

For the earlier portions of this article, the reader is referred to page 131 of the March issue. The effects of plastification, and the relative strength of the various plastics is taken up in the present article.

brought about in the production of molded objects made from casein molding powders. In this case the only mechanical work resulting in plastification is that resulting from the lateral displacement of the individual casein particles. In this process the casein, ground into a very fine powder, is dampened, and then piled up in a frame on an hydraulic press and consolidated into a block. The usual temperature is around 80 to 85 degrees centigrade.

Varying Properties

In this connection it is quite interesting to note that in the German Patent 381104, the specific claim is made that "all plastification is avoided," and that the desired body is directly

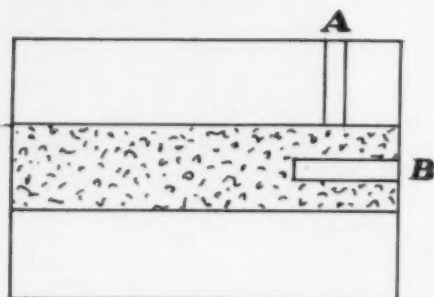
molded under heat from very finely pulverized casein. However, despite this statement of the patent, the effects of plastification in the process is very marked, manifesting itself by a phenomenon that has some analogy with the "calander" effect in the case of caoutchouc. For instance, if a strip of material made by pressing of powder, as shown in figure 6, is further worked upon, as for example if it is made over into a larger plate by stretching, it will be found that samples of the material taken in one direction, (as at point A in figure 6), exhibit quite distinct properties from a second sample taken from the point B.

The actual data obtained in the foregoing case, using a piece of casein solid material sold under the name of *Glorith*, are as follows:

Sample taken from point A:
Maximum resistance to bending strain S_{\max} 970 kilograms per square centimeter.

Sample taken from point B:
Maximum resistance to bending strain, S_{\max} 170 kilograms per square centimeter.

Thus it will be seen that even the movement of the material, under pressure, through the comparatively short space from A to B, has decidedly altered the elastic properties of the same, in that the more elastic material is that in which there has been effected a greater displacement of the individual particles from their original position.



This is still more plainly evidenced by the results obtained with a plate made from material that has first been forced through an extrusion machine. As shown in figure 7, which represents a plate pressed from extruded material that has been superimposed with the extrusion-axes in parallel, the differences in elasticity, in samples taken longitudinally and samples taken laterally, are much lower. In this case the maximum resistance to bending, in a longitudinal sample, is 1390 kilograms per sq. cm., and of a lateral sample 1260 kg., per sq. centimeter.

Chemicals

A second group of manufacturing methods comprises the use of chemicals to bring about the plastification, or at least to enhance the same. Into this group falls the method described in French Patent 472192, which is the basis for the production of *Oyogalith*, a French casein solid. This covers a block-pressing method, which of itself produces a lower degree of plastification, but which is off-set by the employment of peptizing and plasticizing materials, so that the *Oyogalith* may justly be considered as the best product made by the block-pressing method. The patent describes the use of aliphatic and of aro-

matic amines as plasticizers. A somewhat analogous use of amines is mentioned in French Patent 582870, where a transparent material is obtained, without sacrificing the advantageous mechanical properties of the material. In German patent 408407, and in Swiss Patent 72635, transparency is produced by careful degreasing of the casein, and this somewhat lowers the mechanical strength of the product.

Experimental Verification of the Results and Discussion

The conditions controlling in these cases become quite evident, and are quite striking. A comparison, for example, contrasting casein solids and two other plastic materials is interesting.

Comparatively simple tests will show definitely, that the value of the finished product, which is shown by a lowered modulus of elasticity, is directly dependent upon the degree of plastification achieved; and this means that the greater the degree of desaggregation followed by reaggregation, the better will be the resultant plastic body. Referring to the above it will be seen that a sample of *Galalith* that had been made with the use of sieve-plates, such as those illustrated in figure 1 (see March Plastics), proved to have a modulus of elasticity of 30,000 kilograms per sq. cm. Plates, however, that were fashioned from material made in extrusion presses, according to German Patent 368962 (see Figure 6) had a lowered modulus, namely only 25,000 kg./sq. cm. In this case the additional plastification produced by the second pressing operation increased the value of the material considerably.

Effect of Fat Removal

A removal of the fatty substances in the casein, on the contrary, lowers the elasticity, and hence such products, although made by the identical mechanical process, have a higher modulus of elasticity. This is shown in the case of

some rods, who showed a modulus of 39,000 kg./sq. cm. We believe that these results are caused by the fact that the fatty material in the casein exerts a sort of protective colloid action, and that, hence, its removal has a distinct effect on the diminution of the degree of dispergation of the product.

A still greater degree of plastification is that shown in the case of *Erinoid*, which is produced by extrusion in specially modified presses having the type of sieve-plates already described. In the form of rods this material had a modulus of elasticity of 28,000 kg./sq. cm., and in plates subsequently pressed from the rods of 24,000 kg./sq. cm., which is the lowest value found for this type of product, and is a further proof of our theory.

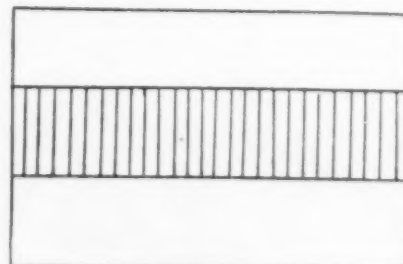


Fig. 7

Strongly in contrast to the materials made by the extrusion process stand the products made by rolling. The lowered degree of plastification is plainly shown by the high modulus of elasticity (abbreviated E hereafter) which is around 40,000 kg./sq. cm. With reference to the product *Galoid*, which shows a value of $E=44,000$ kg./sq. cm., this may be accounted for by the presence of considerable amounts of inorganic filler. An anomalous position is that held by *Oyogalith*, which despite the fact that it is made by a pressing process has a good elasticity value of $E=30,000$. In this respect it is about on a par with *Galalith*. This is a splendid example of the effect of chemical plasticizing agencies.

Lowest on the scale as to elasticity, that is to say having.

(Continued on page 209)

Rejuvenation of Brittle Pyroxylin Plastics

Replacement of the plasticizers and high-boiling solvents by immersion and vapor treatment is relied upon to bring fresh snap and elasticity

THE rejuvenation of old, dry and brittle cellulose ester plastics has been successfully worked out, and comprises broadly the idea of re-introducing into the plastic material some of the high-boiling solvents and plasticizers which are responsible for the flexibility and moldability of the freshly-prepared materials.

In accordance with the new process the plastic is subjected to the action of a rejuvenating fluid containing high boiling solvent, which boils at substantially 100° C. or above.

Use of Diluents

The solvent not only penetrates the plastic but remains in it, and this restores the plasticity. A fluid having insufficient high boiling solvent, e. g. a fluid having only low-boiling solvents, gives a temporary rejuvenation and is not, generally speaking, satisfactory from a practical standpoint on account of the plastic becoming as brittle as ever within a few days.

Desirably the treating fluid may contain a diluent, as low boiling solvent or solvents, or inert substances such as benzol, water, and so forth. A diluent enables better control of the procedure, to the end of obtaining better penetration without excessive colloidizing of the surface as might be the case if 100% strong high boiling solvents were used. Suitable high-boiling solvents are, say, fusel oil, amyl acetate, butyl acetate, diacetone alcohol, acetic acid, and high boiling acetone oils. Suitable low-boiling solvents, that is solvents boiling below substantially 100° C., are, for example, wood alcohol, denatur-

THE pyroxylin plastics, especially when stored for a long time in a fairly dry and warm room, loose enough of the high-boiling solvents and the plasticizer, such as camphor, to cause them to become quite brittle, and much more difficult to work. This problem not only affects the manufacturer, but also the fabricator, who often has a lot of sheet or tube stock on hand for a long time and is faced with the problem of either working it up into useful products or to sell it for scrap.

James H. Sherts, of Newark, N. J. has solved the problem by either immersing the dry and brittle products in a solvent containing some high-boiling composition, or by subjecting the products to the vapors of the same. His patent, U. S. P. 1,657,870; Jan. 31, 1928, is assigned to E. I. DuPont de Nemours & Co.

ed alcohol, acetone, methyl acetate, ether-alcohol, ethyl acetate, and ethyl methyl ketone. An excess of high boiling solvent may be used but it has a tendency to make the plastic too soft; extra seasoning is then required and in addition the cost of rejuvenation is increased due to the high cost of high boiling solvents.

The exact formula of the rejuvenating fluid will of course depend upon the condition of the plastic to be treated, the cost of solvents, the desired degree of softness, and so on. Generally speaking, a treating fluid containing high boiling solvent 5 to 100% and diluent (e. g. low boiling solvent) 95 to 0% may be used. Similarly, the time of

subjection of the plastic to the treatment will vary. Therefore, in practice these factors of formula and time will be carried at will to meet particular conditions.

A suitable formula for a submersion solution meeting general conditions is the following (parts by volume):—

		Preferred
(1) Denatured alcohol	20-60%	40%
Ethyl acetate	10-30	20
Amyl acetate	60-70	40
(2) Ethyl acetate	50-90	70
Butyl acetate	10-50	30
(3) Diacetone alcohol	10-30	20
Denatured alcohol	50-70	60
Ethyl acetate	10-30	20

The approximate submersion time advisable when using a bath having a composition such as the preferred above indicated, for nitrocellulose plastics is

Less than .020 inch thick	3 seconds.
Between .020 and .040 inch	5 seconds.
Between .040 and .050 inch	15 seconds.
Between .050 and .100 inch	30 seconds.
Between .100 and .200 inch	1 minute.
Over .200 inch	2-5 minutes.

The time required to rejuvenate plastic by subjection to vapors depends upon the density of the vapors: it ranges from five minutes to about one week.

Submerging

In treating by submersion it is merely necessary to completely submerge the plastic, be it in the form of sheets, rods, tubes, or whatnot, in a bath contained in a suitable tray or vat. In treating by vapor, a suitable closed chamber with provisions for introduction of the vapors and circulation of the same about and in contact with the plastic may be used. The above formulas may be used, but on account of the low boiling solvents evaporating off first it is preferable to use simply the high boiling solvents and control the process by controlling the den-

(Continued on page 212)

Viscose Type of Cellulose Compounds Adapted to Plastics

The comparatively non-plastic cellulose derivatives are combined with certain metallic salts to produce the desired new effects

HITHERTO PLASTICS has paid but little attention to the particular cellulose compositions generically denominated as "Viscose", as the only commercial application of these types of cellulose compounds has been for the manufacture of artificial silk (Rayon), and in the form of thin flexible sheets for wrapping candy boxes, soap etc., under the name of "Cellophane". Another application has been the making of flexible bottle caps for toilet ware. As these fields are some what remote for the fabrication of plastic materials that are shaped by a molding or pressing operation, it had been deemed inadvisable to include this material in our pages.

However, recent developments point to the application of viscose to the production of artificial horn, artificial ivory, shell and the like, so that this material is now coming into competition with the other forms of cellulose plastics such as pyroxylin and cellulose acetate. The present article before going into the discussion of the process described in a recent patent, gives a short resume of what is known regarding viscose.

VISCOSE is the name given to a cellulose composition discovered and patented by Cross and Bevan in the early nineties of the past century. It is, in reality, a form of pure cellulose, or hydrocellulose, and is not a cellulose ester or ether properly speaking. It is prepared by acting upon cellulose, usually in the form of pure wood pulp, by sodium hydroxide under carefully controlled conditions of temperature, to produce a compound known as alkali cellulose. This alkali cellulose is treated in tanks with either liquid or gaseous carbon disulfide to produce a compound termed cellulose xanthogenate or viscose. This forms an orange to brown solution of about the consistency of heavy molasses.

Ripening

In the commercial manufacture, this xanthogenate is allowed to age and ripen, being daily tested by various chemical tests until it has the proper consistency and properties. This molasses like material is then filtered, and finally squirted

through minute openings in a device termed a "spinnaret" into a solution that will decompose the cellulose xanthogenate and cause the same to revert to cellulose; which, in that case, will be in the form of very thin filaments, somewhat like the silk from a silk worm. This is the basis of making the Viscose silk Rayon, that is now being produced by the millions of pounds, both in America and abroad.

When the cellulose xanthogenate solution is extruded in the form of a ribbon, it forms the familiar Cellophane transparent wrapping material that now appears to cover every candy box. So much for historical background.

Horn and Ivory

Now comes Hans Eggert, of Woltersdorf, Germany, and states that he can produce substitutes for horn and ivory from viscose. He proposes to start with uncoagulated viscose, and, by the incorporation of various fillers, to produce a plastic material that has commercial possibilities. His patent, 1,652,711;

Dec. 13, 1927 thus describes the invention, on which patent was also filed in Germany on Dec. 29, 1922.

It is well known that viscose (sodium cellulose xanthogenate solution), coagulates on long standing and heating i. e. it is converted into an insoluble substance. When the substance thus obtained has been freed from alkali metal hydroxide and alkali metal sulphides by long washing and by drying, a horny substance is obtained which may be used for various useful articles. It is known as "viscoid" and may be used as a substitute for horn or vegetable ivory (or ivory nut substitute).

The most difficult operation to carry out in the manufacture of viscoid is the washing process. It is extremely difficult to remove by lixiviation the alkali metal hydroxide and alkali metal sulphide, especially from large pieces which require at least 30 days washing.

Owing to the extended lixiviation, the substance undergoes alteration in consequence of which even after drying it is inclined to suffer a change in condition or from. Even in dry condition when stored it exhibits little durability as it slowly disintegrates by cracking or crumbling.

Eggert's invention is based on the discovery that the above mentioned defects may be overcome by treating the crude or preliminarily purified sodium cellulose xanthogenate solutions with heavy metal salts or alkaline earth compounds. For this treatment such salts are selected which readily give off their inorganic or organic acid radicals to the alkali (sodium hydroxide or sodium sulphide). Such

metallic oxides and metallic hydroxides as form compounds with alkali metal hydroxids and alkali metal sulphides, (for example aluminium or zinc hydroxides) may also be employed with a good result. The reaction must be carried out slowly and gradually by a correct selection and regulation by the temperature during the treatment, in order that the viscose may not be prematurely converted into an insoluble condition, i. e. before it is introduced into the moulds.

Final Washing

For many useful articles, the product thus obtained by the above process before final washing with water may be subjected to treatment with substances which fix the heavy metals or alkali earth metals for instance by treating the sodium aluminate formed with calcium chloride, whereby insoluble calcium aluminate is formed in the mass and also sodium chloride which is easily removed by washing.

Example I.

100 kilograms crude or preliminarily purified viscose (containing about 7 kilograms alkali) are before coagulation thoroughly agitated in a kneading machine with an excess of about 16 kilograms (calculated when dry) of aluminum hydroxide under continuous cooling to 15 degrees centigrade (if necessary employing vacuum in order to remove air bubbles). The reaction substance obtained is cast in moulds and left to itself to harden (eventually under heating). When coagulation has taken place a short washing for about 5 days will suffice. In fixing the aluminum in the mass it is treated, before being washed for example with a saturated solution of calcium chloride solution, with or without heating, then thoroughly washed and finally dried.

Example II.

7 kilograms (calculated dry) freshly precipitated iron oxide is slowly kneaded or agitated for about two hours in 100 kilograms crude or preliminarily

purified viscose and then when reaction has taken place (which can be easily ascertained from the dark color) about 9 kilograms of zinc oxide are added in small portions and thoroughly agitated in vacuo. Reaction temperature is 10 degrees centigrade. After coagulation in moulds it is washed for about 3—4 days and then dried.

Example III.

About 17 kilograms of calcium acetate is kneaded or agitated in small portions (in vacuo) in 100 kilograms of crude or preliminarily purified viscose and well cooled to +5 degrees centigrade. After about two hours mixing the mass is cast in moulds and left to harden. After coagulation the mass is washed in running water for about three days and then dried.

Coagulation is rather a polymerization of cellulose xanthogenic acid (xanthogenate) molecule with the separation out of the sodium as sodium sulfid or in some other form.

This invention is not predicated upon a process for forming heavy metal compounds with a viscose but rather upon a process in which the heavy metal compounds are employed to combine with the accompanying products which are free in the viscose and which exert an injurious influence on the washing process and thereby on the entire substance.

Nothing definite is as yet known as to the actual commercial utilization of the product. However, it should not be expensive, as the raw materials are cheap.

German Production of Pyroxylin Plastic Materials

OUT of an estimated annual world production of 40,000 tons of pyroxylin plastics, Germany produces between 10,000 and 15,000 tons. Of the latter, Interessengemeinschaft Farbenindustrie Actiengesellschaft, of Frankfort (the redoubtable I. G.) produces one half, or from 5,000 to 8,000 tons.

I. G. production is accounted for by Koeln-Rottweil A. G., which it merged in 1926, a merger that involved close communities of interests with Rottweil's associated Rheinisch-Westfaelische Sprengstoff A. G., Cologne, and Deutsche Celluloid Fabrik in Eilenburg (cellulose acetate manufacturers).

Germany's exports of pyroxylin plastics amount to 2,500 to 3,000 tons annually.

Camphor

Camphor for local pyroxylin plastic production is manufactured synthetically chiefly by one firm in Berlin, controlling Rheinische Kamfer Fabrik of Duesseldorf. More recently, the German Dye Trust (I. G.) is re-

ported to have taken up the manufacture of synthetic camphor. (This information was supplied to the Bureau of Foreign and Domestic Commerce by Trade Commissioner William T. Daugherty, Berlin).

THE Bureau of Foreign and Domestic Commerce's Berlin representative (W. T. Daugherty) announces the production in Germany of Neoresit, a new phenol-formaldehyde synthetic resin. Unusual physical, electrical and mechanical properties are claimed for it. (This resin was referred to as Novoresit in MOLDED PRODUCTS, June, page 304).

Bakelite Wins Decision

A consent decree, granting an injunction, was handed down in a suit between the Bakelite Corporation and the Mica Trading Corporation, involving the Baekeland Patent 1019406. Suit was filed April 29, 1927, and decree entered May 25, 1927.

Aminoplastics Coming Into Vogue

The desire for clear and light-colored molding powders acts as a constant urge to inventors to seek new combinations and methods to meet the growing demand

By Carl Marx

UREA, or carbamide as it may be called with equal propriety, forms the basis of a number of valuable clear condensation products. The usual procedure in the past has been the condensation of the material with formaldehyde or a similar methylene group containing substance, and present progress is along these lines. However, many of the difficulties, such as control of the condensing reaction, elimination of catalysts and the overcoming of after condensation, with the resulting brittleness and internal stresses in the materials are being gradually overcome.

Recent Inventions

The art is quite active, and three patents have issued on the subject within the past few months. The first of these is assigned to the Society of Chemical Industry in Basle, Switzerland, and is the invention of Alphonse Gams and Gustave Widmer. The patent is U. S. P. 1,654,215; Dec. 27, 1927, with a corresponding Swiss application of Oct. 22, 1925, and covers the condensation of acrolein and urea.

Under suitable conditions acrolein reacts readily with ureas, the course of the reaction depending on the one hand on the proportion of the acrolein to urea, and on the other hand on the presence or absence of catalysts, solvents or diluents and also on the temperature of the reaction.

The proportion of acrolein to urea may be varied within wide limits and according to the proportions selected different products are obtained under conditions of reaction which are in general the same. For example,

The advent of Pollopas in Europe, a few years ago, has brought in its train a large number of patents pertaining to the production of glass-clear resinoid condensation products. The difficulties that beset the path of the inventors in the early period of this art are gradually being overcome, and it is probably only a matter of a few years before these highly-refractive, clear products will be available at a price that will allow them to compete with other plastic materials.

It is obvious that if molded products can be prepared in very attractive light colors, either transparent or translucent, that a new era in the plastic field will begin.

with a proportion of $\frac{1}{2}$ mol. of acrolein to 1 mol. of urea there is obtained under suitable conditions a highly viscous syrup; with a proportion of $\frac{3}{4}$ mol. of acrolein to 1 mol. of urea the final products are gelatinous. When the proportion is above $\frac{3}{4}$ mol. (for example about 1 mol.) of acrolein to 1 mol. of urea, solid vitreous products are obtained under similar conditions.

Acrolein and Urea

When acrolein reacts directly with urea, that is to say without the use of catalysts and solvents, the reaction occurs as a rule somewhat slowly at low temperature. Consequently the temperature should be raised above the boiling point of acrolein (52°C.), that is to say, it is advantageous to conduct the operation in a closed vessel.

When catalyst is used the reaction proceeds fairly quickly,

even at temperatures below 50°C. , and according to the choice or quantity of the catalyst, the reaction may become so violent at room temperature that cooling must be adopted.

Suitable catalyst are inorganic or organic acid or bases, such as sulphuric acid, acetic acid caustic soda solution, ethylene diamine; acid or basic salts also serve.

Example 1

12 parts of urea are heated with 11.2 parts of acrolein for about an hour at 100°C. in a closed vessel. A transparent vitreous product is obtained.

Example 2.

12 parts of urea, 5.6 parts of acrolein and 0.03 part of glacial acetic acid are heated together for one hour at 80°C. in a closed vessel. There is produced a vitreous, transparent, highly viscous mass.

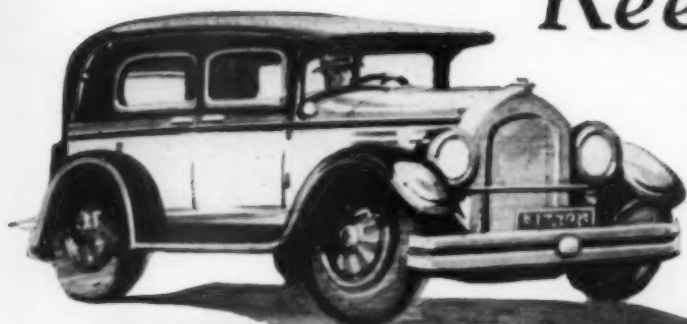
Example 3.

60 parts of urea, 10 parts of acetic acid of 10 per cent strength and 20 parts of water are condensed with 28 parts of acrolein at a temperature below 50°C. to form a syrup which is as clear as water. 28 parts of acrolein are then added and the limpid clear mass is kept for about $\frac{1}{2}$ hour at about 30°C. until it has become strongly viscous. It is now cooled, whereby the mass is changed in a short time into a solid jelly as clear as crystal. By allowing this to remain at ordinary or raised temperature it becomes vitreous and hard.

Seven other examples are given.

Besides acrolein, its polymerides, such as disacryl, or substi-

(Continued to page 203)



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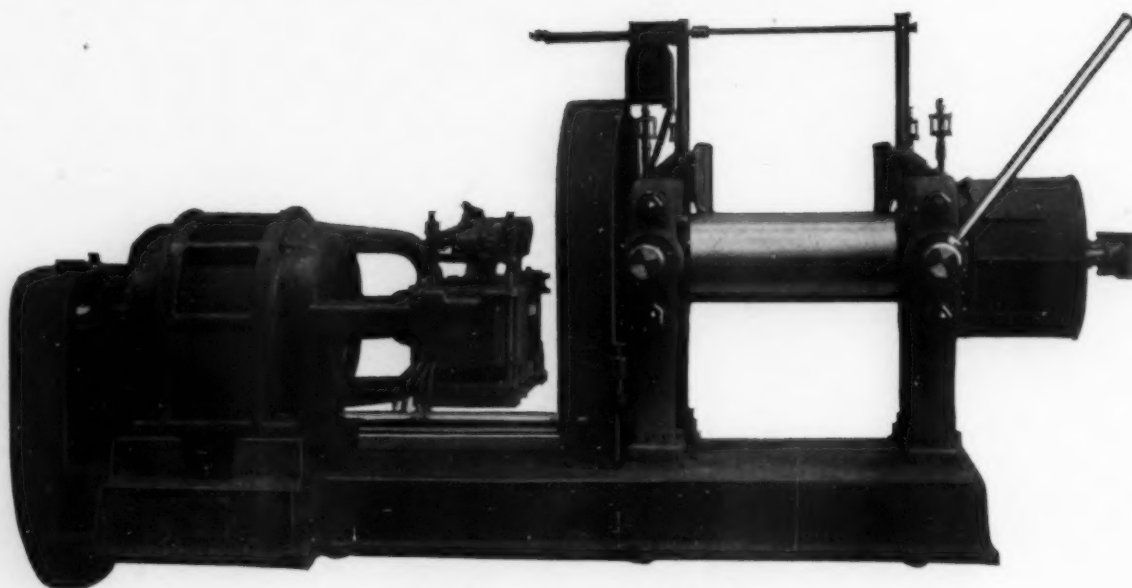
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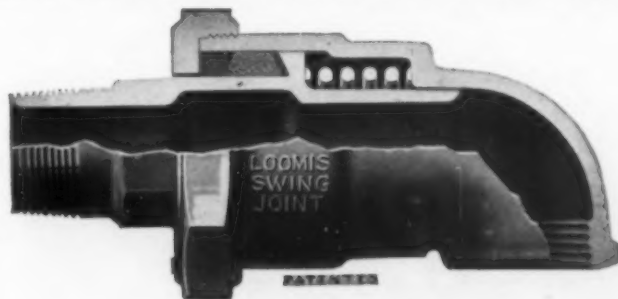
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Embargo on Laminated Products is Recommended by Tariff Commission

Validity of patents forms basis of decision in matter of unfair competition in tariff case

INFRINGEMENT of American patents through illegal importation and the need for protection beyond the slow procedure of the courts are recognized for the first time by the United States Tariff Commission in complaint of the Bakelite Corporation against importers of phenol resinoid insulation.

The commission has just recommended a permanent embargo on laminated sheets from abroad resembling Bakelite panels, declaring further importation to be unlawful. Validity of American patents in this country has never before been accepted as a basis for unfair competition in a tariff proceeding.

Decision

The tariff commission disposed of the case in record time and explained its action in the following extract from its opinion which was approved without dissent:

"Customs regulations forbid giving out advance information which would enable a domestic patentee to institute suits against importers or others in time to prevent distribution of the alleged infringing imports throughout the United States.

"If a domestic patentee should be required to wait until imported merchandise has been distributed throughout the United States and then try to enforce his rights against the individual vendors or users of such products, an almost impossible burden would be imposed upon him. A multiplicity of suits would result, with little

It seems reasonably certain now that the measures taken by the Tariff Commission will serve to protect the interests of the patentees and licensees of the laminated products that have and are playing such an important part in the development of radio and electrical equipment.

likelihood that all infringing dealers could be reached.

Started Three Years Ago

"The inadequacy of the remedy afforded by resort to courts in cases of this character is strikingly illustrated by the record in this investigation. It appears that the alleged infringing articles first began to be imported into the United States during 1925. As soon as their presence in the domestic markets was discovered by complainants, measures were taken to stop their sale.

"Seven suits have been instituted in district courts. Two of these suits resulted in consent decrees, and in a third, after an answer had been filed and the case set down for hearing, a judgement by default was allowed. Four suits are still pending with little likelihood that they will be reached for early decision, due to the congested conditions of the court dockets."

CHEMICAL industries, built and fostered at great expense in this country, are beginning to feel the effects of lower production costs in Europe. Manufacturers there are able to sell synthetic materials in the American market cheaper than the cost of manufacture in this country, notwithstanding tariff restrictions.

As would be expected chemists on this side of the Atlantic have been constantly developing synthetic processes with which to combat this new competition which is everywhere apparent. The protection afforded the industry for such initiative is found in the security of patent rights.

Import Competition

Recently, a practice has developed among certain less scrupulous concerns abroad, engaged in chemical manufacture, to disregard American laws in the sale of their materials in this country. They not only evade the tariff but they infringe upon American patent rights. The cheaper foreign articles are being sold by methods which are distinctly unfair to American producers who recognize and accept these rights under which American trade is conducted.

Unless chemists are able to protect themselves and their inventions by their patent rights, at least, in this country, it will be useless to talk further of building an American chemical industry.

One outstanding example of an American chemical industry is the Bakelite Corporation,

(Continued on page 204)



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New Molding Powder at British Industries Fair

Question of marking on brushes agitates London merchants and importers

By A. C. Blackall

British Correspondent to Plastics

A NEW molding powder has recently been introduced on the British market, in response to numerous requests received by the manufacturers. It is a moderate-priced standard black molding powder and has been developed by the Beetle Products Co., Ltd., London and Oldbury.

This new black molding powder is made from the same resin base as are the "Beetle" colored powders, and, therefore, possesses the same properties of non-inflammability, absence of odor and resistance to water and acids, both hot and cold. A standard unit has now been designed and is being applied in the first instance to the production of this black molding powder, so that the manufacturers are able to claim for this new powder that it will be absolutely standard with no variation whatever from batch to batch. This unit will not be completed for standardized production until late in March, but the makers took the opportunity afforded by the British Industries Fair, late in February and early in March, to place sample lots on the market in order to give the molding industry the opportunity of thoroughly testing the properties of this new powder.

An Aminoplastic

At the Fair molders were asked to test the qualities of the powder under the conditions of molding required by "Beetle" molding powders. The makers are satisfied molders will find it compares very favorably with any molding powder at present

on the market. When the plant is complete absolute regularity in all respects will be guaranteed.

It is already generally accepted that the dielectrical properties of resins from an urea base are superior to those produced from a coal-tar base, and it is claimed that this is the first molding powder of this type to be put on the open market at a moderate price.

Breaking Strength

It is interesting to note that a series of eight moldings from the first batch of black molding powder manufactured in the new unit of plant were sent to W. & T. Avery, Ltd., Birmingham weighing machine and testing machine manufacturers, to be tested for tensile strength. The average breaking point gave a tensile breaking strength of 5,194 lbs. per square inch, the maximum being 5,809 lbs., and the minimum 4,577 lbs. Considering the conditions under which this sample powder was made, these tests may be regarded as very satisfactory and they will undoubtedly be improved upon when standard conditions of manufacture prevail.

The price that has been fixed for the new black molding powder is 1s. 3d. (30 cents) per lb. for contracts of approximately one ton per week, the price for larger contracts to be fixed by negotiation. During the British Industries Fair the makers supplied sample tins of about 40 lbs. and upwards at the price of 1s. 3d. per lb.

The powder has been found to pellet satisfactorily in pelleting machines.

It is stated by the Beetle Products Company that, in supplying this standard black molding powder, its main object is to supply a first-class standard molding powder at an economic price. This will enable manufacturers to modify the temperature of their platens so as to use the firm's molding powders for all purposes and will permit them, at any time, without alteration of method of molding, to enter the new field opened up by the "Beetle" white and translucent colored molding powders, which, it is believed, have an important future before them for industrial purposes. The black molding powder is priced at approximately one-half the figure asked for colored powders. The manufacturers intend to follow it up by introducing standard brown and walnut molding powders.

Origin Marking on Brushes

AFTER hearing evidence almost daily for two weeks for and against an application for an order for the marking of imported shaving brushes and tooth brushes, the Standing Committee appointed under the British Merchandise Marks Act has concluded its inquiry into the matter. The application for the marking order was made by the Master Bone Brush Makers' Association and the British Xylonite Company.

Prominent among opponents of the application was James D. Kiley, wholesale and export merchant and chairman of the Fancy Goods Section of the London Chamber of Commerce. Mr. Kiley, in evidence, declared that an order for marking

would add to the cost of the cheaper goods, which are not at present marked, and would add to the complications of trade, which are already great. Nearly all British brush manufacturers use French handles. Mr. Kiley challenged the assertion that the re-export of tooth brushes from the United Kingdom was very small. Imports usually arrive in bulk consignments, he said, but re-exports go out in small quantities mixed with other goods, and probably the whole consignment would be marked fancy goods. Witness agreed that it was in very few cases that any one could distinguish between British and foreign tooth brushes, unless they were marked with the country of origin.

Opinions

David Greenhill, a member of a London firm importing tooth brushes from Japan, said he did not think cheap foreign brushes competed with British brushes, as Britain is producing more tooth brushes than ever before.

Edward Hack, a London manufacturer and importer of tooth and shaving brushes, said a marking order would only cause delay in executing orders and add to the cost.

The inquiry is now closed and the committee is busy considering the evidence it has heard in order to present an unbiased report to the Board of Trade. Its decision, whether for or against the application, will be quickly acted upon by the Board.

Tableware

ON two occasions reference has been made to tableware made from synthetic resin. The British concern sponsoring the innovation (Beetle Products Co.) has succeeded during the past six months in placing the manufacture of thiocarbamide, the sulphur analogue of urea, upon an economic basis and is said to be in a position to produce synthetic water-white resins and translucent molding powders. Progress has been slow

(Continued on page 210)

Capacity50 tons
Working Area of
Platens18½x12½"
Stroke, Standard12"
Maximum Adjustment
of Upper Platen10"
Motor3 H. P.
Approximate
Weight4800 lbs.
Automatic Ejectors



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1. A mechanically operated ram capable of exerting pressure the entire length of stroke.
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3. Amount of pressure adjustable and can be changed from a few hundred pounds to capacity in less than five seconds.
4. Stroke instantly adjustable to any length up to 12". Longer stroke may be had if desired.
5. Ram may be stopped or reversed at any point of the opening or closing stroke.
6. Ram may be also stopped at any part of the closing stroke for a dwell before exerting final pressure.
7. Positive mechanical ejection. Ejection stroke adjustable.

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TECHNICAL ABSTRACTS AND PATENT REVIEW

Manufacture of Celluloid Rattles. H. Bahls, in *Kunststoffe*, 1927, 17, 245.

A short article describing the sequence of operations in the fabrication of hollow celluloid toys and specifically baby rattles. According to the first method described, two thin sheets of celluloid are placed in a screw-spindle press, having the required mold in it, and steam or hot air is blown between the sheets to cause them to become plastic and conform with the interior surface of the mold. At the same time pressure is applied, in a series of blows, upon the sheets where they overlap, to cause the weld. The weld is afterwards trimmed off smooth. The handles, which are usually made of celluloid rod are inserted into the opening used for blowing the rattle, after the little stones, bells, etc. that are usually found on the interior of the rattle, have been inserted. The handle is attached to the hollow portion by acetone cement.

An alternative method is to form two hemispherical portions on the usual type of press, one being just slightly smaller than the other so that a good joint can be secured by slipping one hemisphere partly into the other. Cement is used to hold the parts together. Various German types of rattles, and a suitable press is illustrated.

Molded Product from Un-calcined Gypsum. Harry E. Brookby, Evanston, Ill., assignor to U. S. Gypsum Co., U. S. P. 1,652,162; Dec. 13, 1927.

The inventor has found that even uncalcined gypsum which ordinarily will not "set" when mixed with water, may be caused to do so if pressure is employed, especially in the presence of substances that increase its solubility, such as sodium thiosulfate, common salt and the like. To produce a molded product raw gypsum is ground so that it will pass about 95% through a 40-mesh screen, while about 75% will pass a 100-mesh screen. This ground gypsum is then mixed in a pug mill or other suitable mixer with 10 to 15% of water, which is only sufficient to turn the gypsum into a slightly damp mass. Organic or inorganic fillers (aggregate) can also be added at this stage and may comprise excelsior, fiber, sawdust shavings, sand, crushed stone etc. The mixed materials, which at this stage are a fairly loose damp powder, are then molded under high pressure in a hydraulic mold, pressures from 6,000 to 10,000 lbs. per square inch being used. This causes the gypsum to set into a final hard product. An alternative method suggested is the use of an extrusion process where the material is forced through dies, and subsequently cut up into the pieces desired.

Compilation of the Subject Matter of Phenolic Condensation Patents

Charles W. Rivise, now a practising patent attorney in Philadelphia and formerly a member of the Examining Corps of the U. S. Patent Office for five years, has digested all the United States patents covering the art of phenol resinoids, besides making a collection of all the patents covering analogous resins such as urea—formaldehyde resins, glyptal, styrol resins, etc.

The phenol resinoid digest covers approximately one thousand (1000) patents and includes every method, machine, article or composition appertaining to such resins and patented in this country. Every patent that makes even the slightest or most incidental mention of this type of resin has been included so that the compilation shows the complete development and evolution of the art. Each patent has been carefully abstracted to bring out every feature relating to phenol resinoids and similar patents are carefully distinguished wherever possible.

A subject matter index in the form of a card index is now in preparation and will cover every feature in the digest.

Inorganic Plastic containing gypsum, dextrin, oil and salts. Gustav J. Liebig, U. S. P. 1,658,605; Feb. 7, 1928.

A plastic molding composition, also suitable for filling cracks in walls, wooden objects etc. consists of gypsum (calcined), borax as a retarder, salt as an accelerator, dextrin as a binder, talc as a filler and a drying oil and rosin as a water-proofing agent. Casein may be used in place of the dextrin. Sassafras oil or the like can be added. **Cellular Cement.** George B. Hinton, Mexico City. U. S. P. 1,657,716; Jan. 31, 1928.

Ordinary cement is mixed into a grout with water which contains a

small amount of a frothing agent such as a flotation oil, or products producing foam such as pine oil, phosphoresylic acid, oleic acid, or sodium resinate. Air is then blown into the mixture to generate a stable foam, and the mixture is allowed to set. A cellular porous cementitious product remains.

Cold-Molding Composition. Frank J. Groten Jr., assignor to Molded Products Corporation, Meriden, Conn. U. S. P. 1,655,388; Jan. 3, 1928.

A composition of:

	Per Cent
Asbestos-fibre	40.1
Slate-flour	41.2
Asphalt	8.4
Pure boiled linseed oil	7.3
East India copal chips	2
Pale crusher drier	1

is prepared at a temperature high enough to have the copal and asphalt fluid. When finished it is a moist powder which is "cured" at from 220 to 240° F for several hours. It is then just tacky enough when cold to permit of very accurate cold molding. It has a good finish and comes out of the molds straight and true. It is then baked at around 225° F for an hour and finally heated to 410° F for 20 to 35 hours to indurate the molded object.

Photographic Medium of Cellulose

Esters. Murray C. Beebe, Alexander Murray, and Harold V. Herlinger, assignors to Wadsworth Watch Case Co., Dayton, Ky. U. S. P. 1,658,510; Feb. 7, 1928.

This is an extension of the fundamental ideas set forth in their patents 1,574,357 (Feb. 23, 1926) and 1,587,269 to 1,587,274 (reviewed in *Plastics*, Oct. 26, 1926, p. 345). According to the present patent, a solution of a cellulose ester, such as the acetate or nitrate, is sensitized to light by the addition of iodoform. If desired, some iodine may also be added. Exposure of such sensitized film to a strong light, as from an arc, for from 15 seconds to one minute will produce a visible image (the light passing preferably through a diapositive or other transparency). The image may be further developed by treating the cellulose ester with a solution of silver nitrate in ammonium hydroxide or a solution of silver nitrate, sugar and Rochelle salts in water.

An alternative method is to employ also, in the cellulose acetate, a dye such as magenta. When the film is afterwards developed for a short time in alcohol the dye will be removed from the spots not hit by the light. The process is applicable to the production of transparencies, or for an etching resist.

Aminoplastics in Vogue*(Continued from page 194)*

tution products such as thiourea and methylurea may be used, the products differing somewhat from each other depending upon the materials used.

Guanidine to Control Reaction

Another patent discloses and claims the use of guanidine and guanidine carbonate together with the urea and formaldehyde, stating that the reactions in that case are much more easily controlled. The inventor is Palmer W. Griffith, of Elizabeth, N. J., and the Patent, U. S. P. 1,658,597; Feb. 7, 1928, is assigned to the American Cyanamid Co., who are themselves large commercial producers of urea.

According to this patent, Griffith states that he has discovered that the addition of guanidine or a salt of guanidine with a weak acid, such as carbonic acid, which is liberated and driven off in the course of the reaction, to a formaldehyde-urea mixture permits the production of colorless, transparent resins from solutions the reaction of which varies much more widely than in the prior processes.

The quantity of guanidine or guanidine carbonate that is added to produce this beneficial result may be as little in amount as one-half of one per cent of the quantity of urea. It was found, however, that the larger the proportion of guanidine or guanidine carbonate used, the wider is the hydrogen ion range over which one can operate. Thus when a mixture of urea and guanidine carbonate in which urea represented 70% of the total and the guanidine carbonate 30% of the total is treated, a hard, colorless, transparent resin could be produced between pH* limits of 4.0 and 6.0.

A satisfactory resin may be produced by the use of guanidine alone without any urea, and a salt of guanidine, such as the carbonate, may be employed.

The following is a specific example of the operation of the process:

Here is a new press for molding Bakelite, Durez, Redmanol, Condensite, Celluloid, etc., in which are incorporated certain features that increase production and decrease mold costs.



This press has been designed to eliminate some of the recurring mold costs by incorporating certain features into its construction, which ordinarily have to be incorporated in each mold, making it more adaptable to all classes of molds.

Hydraulically actuated ejectors top and bottom, are operated independently of the main ram and allow the operator to eject molded pieces at any position of the main ram, thereby saving time.

Hydraulic reseating of ejector pins and hydraulic operation of ejectors is positive and dependable, which is not the case with spring weighted ejectors.

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Essential Books

Plastics and Molded Electrical Insulation.

Emile Hemming. 313 pages. Illustrated. \$6.00.

Very special care has been taken in the preparation of the chapter on molded insulation. Contains hundreds of references to plastic and composition products and their utilization in industry.

* *

Casein and Its Industrial Applications.

Edwin Sutermeister. 296 pp. Price \$5.00. Illustrated. 1927.

Eleven authorities, many of them specialists in this field, have contributed to this volume. "Casein Plastics" is from the pen of Dr. Geo. H. Brother.

* *

The Chemistry of the Natural and Synthetic Resins.

T. Hedley Barry, Alan A. Drummond and R. S. Morrell. 196 pp. Price \$5.50. 1926.

The work of three English chemists, who are recognized authorities on this subject, one of vital interest to the Plastics Industries.

Celluloid.

Its raw material, manufacture, properties and uses.

Dr. Fr. Bockmann. 188 pages. 69 illustrations. \$3.50.

In this book, the raw product, cellulose and its properties are thoroughly described. Other raw materials and methods of rendering them more plastic also receive attention.

* *

Synthetic Resins and their Plastics.

Carleton Ellis. 514 pages, illustrated. \$8.00.

The book will serve as a guide and prove a stimulus to the numerous investigators and practitioners in the field of artificial resins. The section on plastic molding is an especially valuable feature.

* *

Pyroxylin Enamels and Lacquers.

Samuel P. Wilson. 213 pages. Illustrated. \$3.00.

An authoritative work dealing with the materials and manufacture of pyroxylin solutions and with their application in the industry.

A solution containing about 40% formaldehyde has dissolved in it urea and guanidine carbonate, the latter being equal in amount to about 10% of the weight of the urea. The formaldehyde is in the proportion of two mols to each mol of urea and guanidine carbonate used. The solution is filtered to remove any insoluble matter that may be present, and then brought to a boil in an apparatus with a refluxing condenser. After refluxing the solution for thirty minutes the condenser is removed and the solution evaporated until about two-thirds of the water has been removed. During the evaporation reaction of the solution is adjusted to the neutral point of methyl red using for this purpose an acid, such as hydrochloric acid. The concentrated solution is then placed in a drying apparatus, the temperature of which is 60° C. at the start and which is gradually raised to 80° to 90° C. After from three to six hours a hard, colorless, transparent, resinous material as a final product is obtained.

The third patent deals with the condensation of urea with solid polymers of aldehydes. It involves the preparation of concentrated solutions of polymerized aldehydes and urea, followed by condensation to form glass-clear products.

In his patent, U. S. P. 1,658,359, Feb. 7, 1928, Friedrich Ernst Karl Steppes, of Harburg-on-the-Elbe, Germany, describes his process as follows. (The invention is assigned to the firm of Dr. Heinrich Traun & Söhne, formerly known as Harburger Gummi-Kamm Co.)

Polymers of Aldehydes

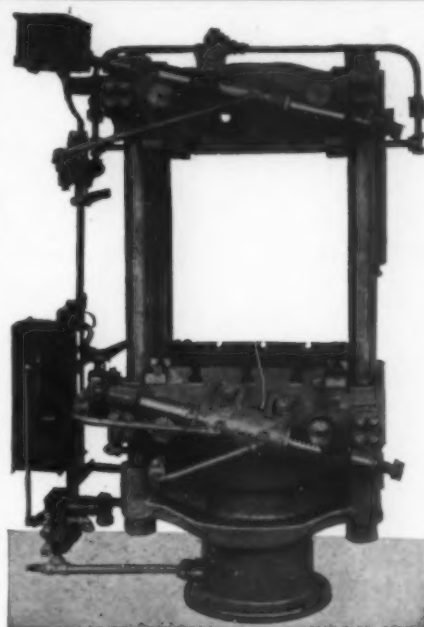
"My present invention is based on the discovery that by a certain novel treatment there be produced, from solid polymers of formaldehyde, clear solutions of a concentration thought impossible. I have found that I can obtain from solid polymers of formaldehyde, with the addition of suitable neutral, acid, or alkaline (basic) substances,

Write Book Dept. PLASTICS, 471 4th Ave., N. Y.

clear aqueous solutions containing up to 75% and over of solid matter (including urea), in other words, solutions which for each 75 parts (by weight) of solid bodies contain only 25 parts of water, or even less. I found further that with a solution of this very high concentration the formation, from urea and formaldehyde, of a condensation product suitable for various purposes could be effected by heating or boiling in an open vessel (that is, under atmospheric pressure) in a remarkably short time (about ten minutes). Moreover, this short treatment also proved sufficient for removing the water to such a degree that the mass became readily moldable and adapted for the subsequent hardening without any intermediate treatment. Thus my invention overcomes the previously existing difficulties as to the removal of water.

It will be apparent that the new process is far superior to the prior ones as to cost of operation, in view of the exceedingly short time required for the boiling and the fact that no special apparatus is required. The shortness of the reaction period or phase precludes the occurrence or development of undesirable secondary reactions impairing the quality of the final product, such as undoubtedly take place below the counter-current cooler etc. under the practice employed heretofore, where the very sensitive urea and formaldehyde were heated for hours. The improvement is shown by the uniform progress of the reaction, the very abundant yield (fully 90% of the raw materials employed) and the excellent quality of the mass produced, which even in large-sized pieces can be hardened without difficulty.

The finished product is a colorless mass of glass-like clearness, possessing practically absolute permanence under the influence of light (proof against fading or discoloration or clouding when exposed to light), and such hardness that articles of all kinds may be made from it



Semi-Automatic
80 Ton Bakelite Press

Moulding Presses

For all Plastic
Materials

This cut shows one of ten presses with adjustable ejectors on both top and moving platens.

The high and low pressure operating valves are manipulated by an automatic electric valve control, without cams or shafting.

We manufacture hydraulic presses for all hot and cold moulding processes and also complete equipment including hydraulic accumulators, pumps, valves and piping.

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A new Automatic Control for
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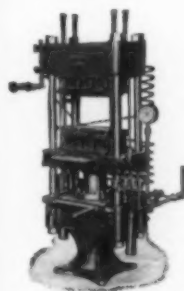
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Works: Florence, N. J.

MOLDING PRESSES UPWARD or DOWNWARD

Fig. 1



To
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Work

ANY SIZE
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you work
out your
problems



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Pyroxylin Plastics Scrap



**All Grades and
Colors**

Bought and Sold

**In Large
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by cutting, turning, milling or like operations. The mass refracts light in a manner similar to glass and may be used instead of glass for optical and other purposes and possesses the advantage over glass of being capable of being turned in a lathe, and harder to break and not splintering when broken.

The mass in addition is capable of being colored in imitation of all precious stones, as well as beads, and ornamental articles of all kinds, as well as fancy goods, dishes, boxes, etc. If the mass is colored with pigments or rendered opaque it may be used to advantage as a substitute for opal glass, porcelain, alabaster, wood, ebony, bone and other substances.

With Paraformaldehyde

An example of the practical carrying out of my invention is as follows:

Take for instance, 504 parts by weight, of 95% paraformaldehyde, 100 parts of 7% ammonia, and from 200 to 240 parts of water, heat the mixture until the solids have been

dissolved, when the clear aqueous solution will contain more than 40% of paraformaldehyde, and then dissolve in this solution 480 parts of urea. If required, the solution is then filtered. Thereupon the solution (with or without this preliminary filtration) is heated until it boils violently, in an open vessel and while stirring. The condensation reaction, which is thus brought about is completed within about ten minutes. This may be recognized by taking a sample of the mass, which at the end of the reaction should be a thick liquid, but still susceptible of being poured for molding. The boiling operation having been stopped, the mass is poured into molds and solidifies after a while. While the mass is still fluid, I may color it by means of soluble pigments or dyes, or mix it with insoluble pigments and/or fillers of any suitable character. The subsequent hardening is obtained by again heating the mass, the temperature remaining below 100° centigrade during this second heating."

Embargo on Laminated Products

(Continued from page 199)

founded upon the inventions of Dr. L. H. Baekeland, of New York, who has made other notable contributions to American chemical progress. Some of the largest industries of this country have extensive investments in Bakelite departments in their plants and their business is endangered by ruthless practices abroad.

The materials produced by the Bakelite Corporation are sold direct to manufacturers who mold and machine them into articles ranging from jewelry and smoking novelties to radio panels and automotive gears. Because of the vastness of the field opened by the inventions of Dr. Baekeland, which constituted the first practical use made of phenolic resins after fifty years of experiment, the corporation has continuously engaged in extensive researches.

More than 200 patents have been obtained covering the results of this research. Dr. L. V. Redman, one of the pioneers in this branch of synthetic chemistry, and now director of research in the Bakelite Corporation, is the inventor of processes for joining two or more colored sections of resinoid material chemically, instead of mechanically. This process is used to manufacture multi-colored cigarette holders. Until recently a similar product imported from Czechoslovakia was sold without let or hindrance in this country and was frequently mistaken for the Bakelite material. An embargo has been placed upon such importations now, however, pending final determination of an appeal taken by importers. It has required two years to prosecute this case under the tariff act to a stage

approaching final decision by the President. The case is without precedent and both sides have raised constitutional questions.

Another flagrant violation has occurred in the meantime involving a much greater abuse of American trade practice. Among the more recent developments of Dr. Baekeland in the application of synthetic resinoids has been the use of Bakelite varnishes in producing laminated sheets, rods and tubes. Cotton fabric is employed extensively in making this type of material which is used for radio panels, insulation parts, gears and other devices. A large amount of American capital is invested in the business of fabricating these laminated materials.

It now appears that extensive importations of laminated stock are injuring the market for these products manufactured in the United States. Some of the imported materials are sold as Bakelite panels and in numerous instances the name of the country of origin has been scratched or erased from the panel. A large amount of this cheaper material is coming from Germany although the source extends to Sweden, Czecho Slovakia and Switzerland.

Patents Still in Force

It is possible that foreign producers as well as manufacturers in this country who buy these materials are under the impression that the Bakelite Corporation no longer controls the rights to the Baekeland inventions. It is true that several of the early patents have expired but *virtually all of the industrial uses of Bakelite materials are covered by patents which are now in full force and effect.*

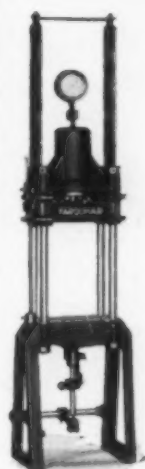
Jonas W. Aylsworth, another American chemist did notable work with synthetic resins, in the later stages of their development and his patents covering varnishes used for making the laminated material are now owned by the Bakelite Corporation.

These rights have been successfully defended in the United

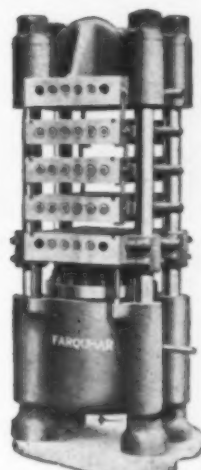
FARQUHAR HYDRAULIC PRESSES

For Every Moulding
and Vulcanizing
Operation

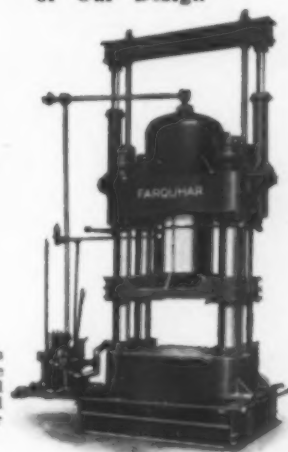
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Press—Sizes 3 to
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We design and build Hydraulic Presses to specifications furnished us and for the particular requirements in the individual plants. Also special machinery constructed of castings and steel plates, specializing on Jacketed Pressure machinery. We have adequate facilities for making almost any kind of Gray Iron Castings. Let us quote you on your next Hydraulic Equipment.

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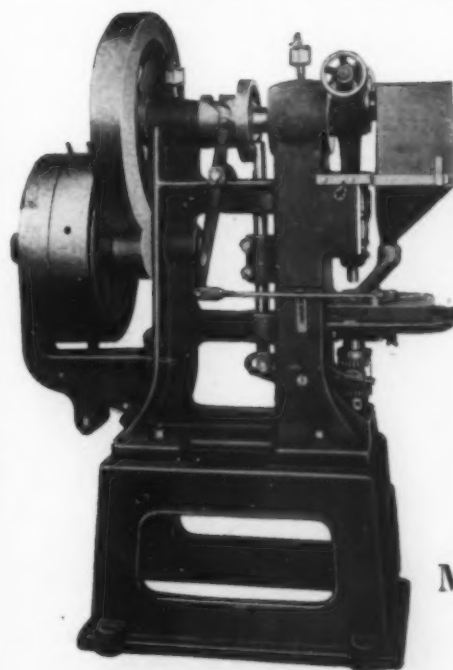
40 to 60
preforms per minute

Odd shapes and
perforated pieces
easily produced.

Weights accurate
and easily adjusted

We also manufacture a
Measuring Machine
which weighs without
preforming

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Stokes Preforming Press

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HYDRAULIC PRESSES



600 Ton 5 opening Steam Platen
Press with Steel Platens and
Hydraulic Elevator

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STEEL PLATENS
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**We Have a Press
Exactly Suited
To Your Work**

**HYDRAULIC PUMPS
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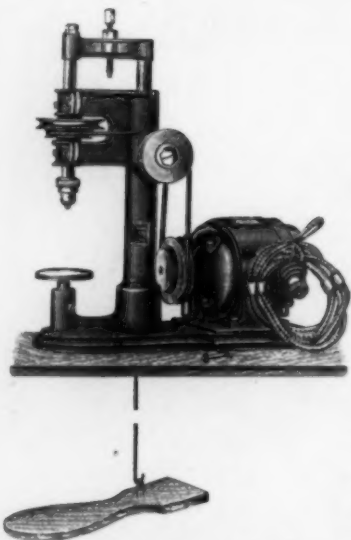
States. The Bakelite Corporation and those other American interests recognizing its scientific advances and using its commercial products successfully and satisfactorily, now seek protection from a foreign industry which is taking unfair advantage of the American producers by disregarding the laws and institutions of this country under which our industries are able to prosper.

As these foreign makers of phenol resinoid materials are immune from direct prosecution in the United States courts, it has been necessary to appeal twice to the Tariff Commission for relief.

In the first instance, covering illegal entry of jewelry and smokers' accessories, made of the resinoid materials, the Tariff Commission held that unfair practices did exist which called for remedy. The U. S. Court of Customs Appeals was then asked by importers to review the findings of the commission. The second instance covers the importation of laminated material depressing one of the largest markets for Bakelite materials in the radio, electrical and automobile industries. This case was called for an initial hearing by the Tariff Commission for Monday, January 30.

What is asked is no more than a fair opportunity for chemical industries to develop whether here or abroad. An important basis for these industries rest in the inviolability of the rights of invention. This point is hardly open to argument under present laws, and for the future security of the American chemical industry it is to be expected that this matter will be settled promptly and decisively by the proper officials in Washington.

No. 3 Drilling Machine



Nothing better for drilling plastic materials, and production work on light metal parts.

Fitted with high grade drill chuck, capacity $\frac{1}{4}$ ".

Foot operated, leaving both hands free to handle work.

Drill has two spindle speeds, 1100 and 2800 R. P. M.

Can be used wherever there is an electric light socket. Is equipped with a $\frac{1}{8}$ H. P. Westinghouse Motor, belted and ready to run.

High in Quality—Low in Price

Standard Tool Co., Leominster, Mass.

MAKERS OF

**CELLULOID WORKING MACHINERY
TOOLS, DIES & MOLDS**

**Patent History
of the
Fiber Gear**
by
JOSEPH ROSSMAN
Starts in
the MAY Issue

Properties of Plastics

(Continued from page 190)

the highest E value, stand the casein products that are produced by pressing a powder. The very slight displacement of the casein particles and the insufficient opportunity for their orientation are the cause of this. Not even the tremendous pressures applied and the fine comminution of the material suffice to overcome this condition. The abnormally high figure of $E=44,000$ kg./sq. cm. is thus explained.

Comparisons

A comparison of the elastic properties of the materials just mentioned with those of resinoids and pyroxylin plastics is therefore very instructive. In the case of the resinoids the final particles of the material are built up to their size by molecular condensation and polymerization from two molecularly dispersed phases, whereas in the case of the pyroxylin plastics the mechanical as well as chemical desaggregation is carried to the highest degree. Whether the comparatively high value of E in the case of resinoids, namely on the order of 36,000 kg./sq. cm. can be explained by the unfavorable degree of dispersity in this material, by the unfavorable shape of the particles or by insufficient orientation and reaggregation, remains to be ascertained. It is fairly certain, however, with reference to the experiences obtained with other materials, that the comparative absence of mechanical work in the production of these resinoids has at least some effect in bringing about the anomalous values found for the phenol-formaldehyde condensation products.

Stirring

The already mentioned stirring during the condensation probably effects the formation of chains of particles, the forming of elementary fibers, and

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in
Paste
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buy back scrap
Pyroxylin from
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ice from the
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Nixonoid
in
Sheets, Rods and Tubes
Super
Pearl Essence
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Lacquer, Amyl Acetate or
Solution Ready to Apply
New England Representative
For
NIXON NITRATION WORKS
HUDSON PEARL CO.

PEARL ESSENCE LACQUER COTTON

possible also a certain amount of orientation of the aggregate in the material, by reason of the currents thus set up in the viscous mass.

In the case of the pyroxylin plastics, on the contrary, all of the conditions for the most favorable mechanical as well as chemical plastification are found. The very raw material, cellulose, is of itself a fibrous nature, which, by the nitration and the subsequent stabilization and treatment is subjected to a very thorough dessagregation and dispergation. Also the individual particles are elongated and their reaggregation and chain-formation during the various masticating and rolling operations is most complete. All this supports the theories that we have discussed, as the modulus of elasticity of the pyroxylin plastics is as low as 5,000 kg./sq. cm., which is the lowest of all of the artificial plastic materials.

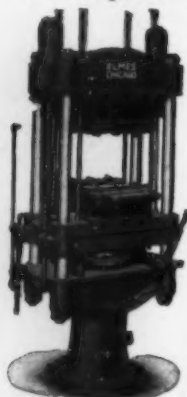
Tableware

(Continued from page 201)

particularly with respect to sales of tiles, labels, panels, etc., but progress has been made in the sale of molding powder for tableware and articles required in the electrical, motor, and other trades.

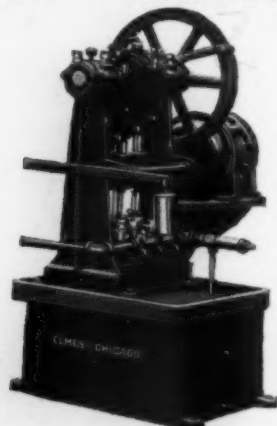
The company has come to an agreement for the formation of a Tableware Molder's Association which involves the formation of a selling company to handle business where collective selling is advantageous. Sales of molding powders have been made in the United States and negotiations are being conducted with two American firms—one for the sale of molding powders and the other for the operation of patents in the United States. Similar negotiations are in progress for one of the European countries. This information comes through the Bureau of Foreign and Domestic Commerce, Chemical Division.

Hydraulic Plastic Moulding Equipment A Complete Line for the Manufacture of Insulating Parts



No. 2693

The only design of press where the knockouts are returned without moving the press ram, or manipulating the valves. This patent feature permits re-seating knockouts and die buttons without loss of time, and a maximum clearance for cleaning and refilling dies, giving 10% to 20% greater output.



No. 2910

High and Low Pressure Pump with manually controlled Low Pressure Discharge. This pump when direct connected to a press reduces the flow through the release valve when it is desired to exhaust the press, thus permitting a quicker return of the press ram.



No. 3000

Compressed Air Accumulator.
No Shocks.
No Foundation.
No Heavy Ballast.
Less Head Room.
Less Floor Space.
No Guide Springs or Bumper Blocks.
Locate where most convenient.

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New York—Export Office, 420 Lexington Ave., Phone Lexington 4270

E-HYDRAULIC-ELMES
PRESSES
SINCE 1851



Accessories

For Toilet Articles



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the Better Kind
for
Fabricators
of
Celluloid
Toiletware**

We Specialize in
French Mirror Plates

Tassi Bros.
525-531 W. 24th St.
New York City

Moire Effects on Pyroxylin and Cellulose Acetate Plastics

The vogue of "pearl" effects in the pyroxylin plastics proved to be a very lucrative one, and the popularity of this effect has not waned perceptibly.

Moire or "interference" effects, however, present a new departure in this field. The Cellanese Corporation, which is an off-spring of the British Cellulose and Chemical Mfg. Co., and its American plant in Maryland, is responsible for the latest change in this field. As may be recalled by our readers, the Celluloid Co. has recently combined with this corporation under the name of the Celluloid Corporation, and has engaged in the manufacture of cellulose acetate plastics on a large scale. For this reason all new developments

YOUNG MAN with strong following in industrial field wishes position in moulding industry. Seven years sales and factory experience with one of the largest pyroxylin manufacturers. Particularly familiar with Adding Machine, Cutlery, and Fountain Pen trades. Age 30. Available April 10th. Write Box 60, Plastics, 114 E. 32d St., N. Y. C.

WANTED—To buy a molding plant in the vicinity of New York. Equipment and plant should be ready to use. Box 52.

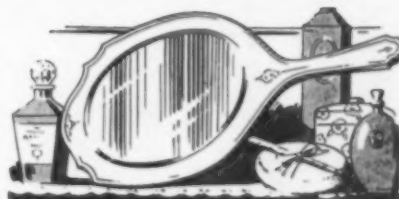
This column is the place to make your wants known. If you need help want a job or have machinery to sell, try an ad on this page. Plastics, 114 E. 32nd St., N. Y. C.

in this line arising from the research work carried out by this organization is of interest to everyone dealing with plastics.

According to U. S. P. 1,641,962, Sept. 13, 1927, of William A. Dickie and James H. Rooney, both of Spondon, England, and assigned to the Cellanese Corp. of America, "interference" effects (that is to say a play of colors) can be obtained on transparent or translucent cellulose ester plastics by molding into their surfaces a very large number of parallel lines or a grid of such lines crossing each other at an angle.

By Wire Gauze

This is brought about by placing sheets of a cellulose ester plastic between two plates covered on the side that contacts with the sheet with finely woven wire gauze, preferably of phosphor bronze of about 140 meshes per inch. The plates are placed into a hydraulic press and heated to about 100°C. and submitted to pressure to impress the wire-gauze design into the cel-



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Buffalo

lulose ester. Preferably the two sheets of wire-gauze are slightly out of register so as to insure the maximum interference effect. The sheets are cooled while still in the press and under pressure to set the design thus imprinted.

An alternative method is to pass the cellulose ester sheets between rollers properly engraved.

(There appears to be some analogy between the effects obtained and what has become known in the textile art as the "Schreiner" effect.—Editor).

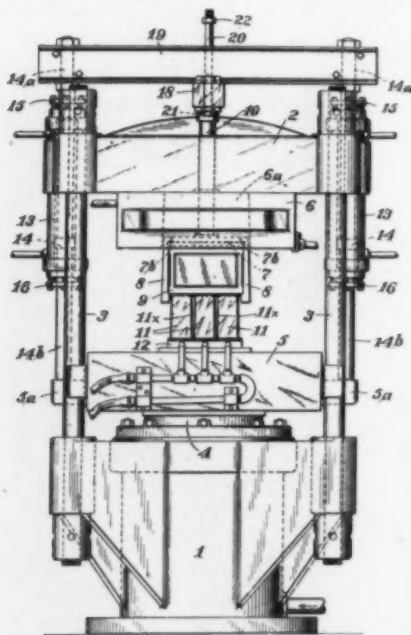
**"Printing on
Celluloid
an old art"
See MAY**

Press Suitable for Battery Boxes

Constant improvement in hydraulic equipment for fabricating plastic molded articles is evidenced by the activity in the press field

LOUIS W. HOTTELL, of Erie, Pa., has patented two modifications of a hydraulic press suitable for molding containers such as battery boxes. One patent relates to a press that works with a heated mold, as when making vulcanized rubber boxes, and the other is especially adapted for plastics that set by the cooling of the mold. The patents are 1,652,991, for the vulcanizing type of press, and 1,652,940 for the cooling type, both patents being granted Dec. 13, 1927.

Among the objects of the invention it is proposed to provide a novel mold construction and means for actuating and controlling the mold, and especially to facilitate the automatic removal of the finished box from the press. The figures show the general type of press employed.



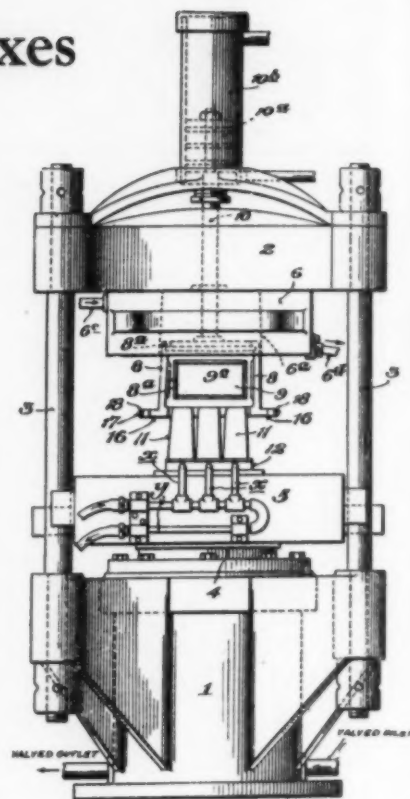
The claims cover: (U. S. P. 1,652,991).

In a press for forming and vulcanizing rubber articles, a

fixed platen, a movable platen opposed thereto, a mold cavity mounted on said fixed platen, a core mounted on said movable platen, a ram for projecting the one platen toward the other, a pair of fluid pressure cylinders mounted on said fixed platen and capable of exerting pressure in either direction, rods extending through and actuated by said cylinders and impinging against the movable platen to pull said core, a cross bar connecting the opposite ends of said rods, an articulated mold designed to be seated in said mold cavity, and means associated with said cross bar for seating and ejecting said mold.

And (U. S. P. 1,652,940):

A molding press for hollow articles including a stationary mold chamber, and articulated



mold suspended within said chamber, a ram carrying a core operating into and out of the mold, said ram being adapted to release itself from the mold and the article by gravity, and means for lowering the articulated mold to permit removal of the finished article.

REJUVENATION OF PYROXYLIN PLASTICS

(Continued from page 191)

sity of the vapors. This may be done by raising or lowering the temperature as will be understood.

After treatment of the plastic it is hung up to dry in suitable chambers, taking care to prevent it touching other objects as it is very soft and will become marred. After thus drying at room temperature, say 70° F., until it is no longer sticky, approximately 15 minutes, the plastic is placed in a warm room at approximately 100° F. for approximately 48 hours. It is then substantially in the same condition as at the end of its regular seasoning, in the usual process of manufacture, after being

newly manufactured, and can be pressed, polished, and worked in the same manner as new goods.

A specific illustration of the working and effect of the method, is as follows:—Thickness of goods, .909 inch; original residual solvent content, between 2 and 3%; deteriorated solvent content, fraction of 1%; treating solution; formula "1" in preferred amounts; time of treatment 1 minute; drying as specified above; residual solvent, 3%.

Other plastics, such as cellulose acetate may also be treated the procedure, solvents and so on, as above, being suitable.

MOLDED PRODUCTS

Devoted to the purchase, further use and merchandising of all manner of molded parts

Vol. 2

APRIL, 1928

No. 4

Originator of Dollar Watch Uses Phenolic Resinoid For Dollar Pen

New Ingersoll Pen is making use of molding material to produce a dependable colored pen at popular prices

By J. A. Maguire

REMEMBER your first watch? Nine out of ten it was an Ingersoll. Probably you got it at Christmas or for your birthday. In any case the time finally came around when Dad or Mother decided that the "boy" should have a watch. Very few boys would have received watches had it been necessary to spend as much as Dad had to spend for his. But then; you could get a watch for a dollar that would serve the actual purpose of a watch; and that was to keep time. True it didn't have the fine gold case that Dad's watch had but it did keep time. It didn't cost much but it served every purpose of the more expensive watch.

And the dollar watch was not confined to boys alone. Their elders soon learned that they could get everything out of the cheap watch that they could expect of their more expensive

watches except display. It didn't have the looks, but it did have the works. From a manufacturing and sales point of view the Ingersoll plan was quantity production and large sales. "To give all we can for what we get" not get all we can for what we give.

Idea Long In Mind

For a number of years Mr. Chas. H. Ingersoll while active head and half owner of the Watch enterprise had in mind the same idea for a quality fountain pen. A pen that could be produced to sell at \$1.00 which would have all the good working qualities and ability to stand up under hard usage that the expensive pens had, but that could be produced at a price within reach of all.

Of course there have been pens on the market for some time made of rubber and other

substances that sold for \$1.00 and even less. But they were made by manufacturers who did no national advertising and who did not stand behind their product with a guarantee. These pens practically without exception were all made without an iridium tip on the gold pen. This meant only one thing. The pen could not stand up. It would not stand the "gaff" of hard usage.

Some four years ago Mr. Ingersoll started producing a pen to retail at \$1.00. It was made of metal. Sales were very good on this pen but it had one serious drawback from a modern merchandising standpoint. It lacked color. During all this time Mr. Ingersoll and his organization have been trying to remedy this defect. They had been able to turn out colored pens, but had not been able to turn out a pen that would pre-

Personal Statement by Mr. Chas. H. Ingersoll

"THE urge to supply human needs and to conform products to human tastes is irrepressible, and goes to make up the eternal conquest constantly going on around us in operating what is known as 'The Law of Supply and Demand'."

"The demand for a cheap watch, though in the outset generally unrecognised, was found to be without limit, and this means, in a country of 125 millions, not to consider the rest of the world, a business opportunity of importance, and also an opportunity for service to the masses."

"More spectacular, of course, was Ford's discovery that other than millionaires, or even the middle class, could make legitimate use of automobiles, hence his 1,000 a day idea."



"Fountain Pens have been supplied in two general divisions, perhaps equally divided numerically. First, those above in price the reach of the mass of buyers. Second; those

beneath their requirement in quality."

"In these circumstances, the obvious job for 'Ingersoll' is to supply a pen combining high quality with low price, and the new material climaxes our appeal to the millions by adding the touch of conventionality to quality already achieved."

"The perfect mechanical points, the accuracy of fit of cap to barrel and of pen and feed, the perfection of the threaded parts, the stability of the attached parts, the brilliancy of finish and texture, the quality of indestructibility, the non burning character, and finally, the beautiful assortment of attractive colors—all these, and more, indicate that this new adaptation is appropriate, mechanically, conventionally, and, therefore, commercially."

sent a good appearance and at the same time gave an honest value at the dollar price, but were compelled to charge \$1.50 to \$2.00.

But now by the use of a phenolic resinoid material they have been able to achieve their aim. Color, Quality and price. Color, every molder and user of molded products knows can be obtained in this material. As to Quality the Ingersoll Dollar Pen Co. are backing this pen with their guarantee. And the price is there. The same as the metal pen \$1.00. It is also made in the so-called oversize size at \$1.50 and \$2.00 depending on whether it has white metal lip guards and clip or whether these are made of gold. The more expensive pens also have larger pen points and other refinements.

The pens are produced in the following colors. Cardinal Red,

Olive Green, Mottled Mahogany and Black. All these colors are clear and bright and the pens have the high lustre characteristic of the material.

Using the same business acumen that made the name famous in the watch industry, Mr. Ingersoll when he finally decided on the use of phenolic resinoid did not attempt to do his own molding. He took his problem to a reliable custom molder and turned the job over to them to turn out the complete cap and barrel.

Molded Ready For Use

The cap and barrel comes out of the mold with the thread already molded into the material. The cap is given additional protection against breakage by the use of a metal band around the lip placed in the same manner as though the pen were made of rubber or other material.

The section is also molded. The feed for reasons which will be obvious to any manufacturer or dealer in fountain pens is made of rubber.

The one big feature of this pen from a manufacturing standpoint is that being made from this type of material in molded form each and every piece is uniform and interchangeable. There need be no expensive operations machining the barrel to fit the cap or fear that shrinkage will prevent the threads from taking hold. All the pieces are made in standardized molds. They all come out the same and are all uniform. The benefits to be derived from this from a production point of view is obvious and needs no elaboration.

Looking at this new pen from a sales angle the most striking feature is, that here is an article for which there is an untold

potential market. And at the same time we do not believe it will disturb conditions to any great extent so far as any legitimate manufacturer is concerned any more than the old "dollar watch" cut into the sale of higher priced watches. Instead of lessening the demand for higher priced pens made of other materials we believe it will help this market, just as the Ford has been a factor in increasing the sale of higher priced cars. Real salesmanship of the constructive sort is displayed in this new pen. Instead of entering into a cut-throat warfare with their competitors they have developed an article which will open up an entirely new and virgin field. This pen will get into the hands of thousands who otherwise would not be able to own a foun-

tain pen. In this way everyone all down the line will be benefited. It first opens up a new market for the use of molding material which should run into a very good volume in a short time. Next, it permits the manufacturer to do an increased business without disturbing market conditions. It gives the merchant a new article of real value. And finally it gives the ultimate consumer a full dollar's worth of writing instrument that has all the good points of the more expensive article so far as utility is concerned.

New Field Conquered

This new development is interesting in more ways than one. It shows in a striking manner the adaptability of molding materials to new uses in new fields. It shows the ability of

the human mind to stick right on to one idea and keep slugging until rewarded by success. Mr. Ingersoll wanted to make a pen at a fixed price of \$1.00. He wanted that pen to have all the working qualities of higher priced pens and in addition he wanted good looks. The first was easier to attain than the second. However this is where molding material stepped in and filled the gap.

And so we go. Each day sees something new, something that only a short time back was considered impractical but is now a complete achievement. The industry is not only Plastic by name but plastic by nature.

The job is being done for Chas. H. Ingersoll Dollar Pen Co., by Boonton Molding Co., Boonton, N. J., using Bakelite.



It is naturally impossible to show the beautiful colors of these pens in a black and white illustration.



Molding Material Is Used In Handle For New Iron

This high grade pressing iron required a handle in which good appearance would be combined with durability and close tolerances in insets

THIS article will illustrate in a rather striking manner the well known fact that a satisfied customer always comes back. And in a number of cases when they come back they bring along other members of the family. In this particular case The DeJur Company has long used phenol resinoid materials in various parts of their equipment, and always with the best of results. So that when they were working up the design of their new, high grade pressing iron, what more natural than that they should turn to the material and source of supply that has always given satisfaction?

Qualities Needed

This company as stated was about to market an extremely high grade pressing iron and when it came to selecting a handle for the iron, there were a number of points to be taken into consideration. The handle must look substantial and have a good finish which it would retain. It must be made of a material which would insulate

the operator's hands against the heat, and it also must be effective as an electrical insulator, since the electrical mechanism of the handle itself is somewhat complicated.

Close Tolerance

This mechanism is a three resistance reostat, operated by a push button and made from stamped parts. The contacts and leads are also stamped and the construction of the handle is such that the pieces are very accurate fits throughout.

The tolerances to which the various parts of these handles are held are very close, being plus or minus .002 of an inch. By molding the piece from a phenol resinoid product, these tolerances can be maintained regularly and without variation and the work is done with one operation. With practically any other material expensive machining operations would be necessary to obtain the same final results.

The molder, therefore, gets the job, as it is possible for him

to turn out in one complete operation a handle which presents a very good appearance, is unaffected by heat, acids, or alkalies and is extremely resistant to wear.

The one big advantage that the phenolic resinoid group of materials has in a job of this nature is the close tolerances to which it is possible to hold the completed article. This is particularly true in the case of an article such as this.

Here we have a number of metal inserts most of which have to make contact with other metal parts which are stamped out. If this handle were made of wood or metal there would be quite a great deal of expensive machining operations necessary in order to make all parts match up properly. By the use of molding material it is possible to obtain these mechanical advantages as well as fine appearance.

This job is being done for the DeJur Co., by Allen & Hills, Inc., Auburn, N. Y., using Bakelite.

Molded Products At The British Industries Fair

By A. C. Blackall

THE British Industries Fair of 1928, which has just been brought to a very successful conclusion, was easily the most successful, as well as the largest, of the series yet organized—despite the fact that it was the thirteenth to be held! It greatly exceeded its predecessor both in size and in the variety of the display. The number of firms which exhibited at the London section alone numbered 1,400, and this part of the Fair occupied some 77,000 square feet more than last year, bringing the total up to a quarter of a million square feet of space.

The exhibits of molded products were chiefly concentrated in the London section at the

White City, and made an extremely effective display. At least a dozen firms were represented and the most important of these are briefly dealt with hereunder.

The Souvenir Manufacturing Co., Ltd., of Birmingham, had a stand devoted to the display of "souvelo" ware, a new molded product produced from fine impalpable powder. The finished product has a beautiful lasting polish that is unaffected by heat or damp, and which is claimed to be unattainable by any other means. With the silver or E. P. N. S. mounting, which draws out and enhances the rich color tones, these articles are of considerable artis-

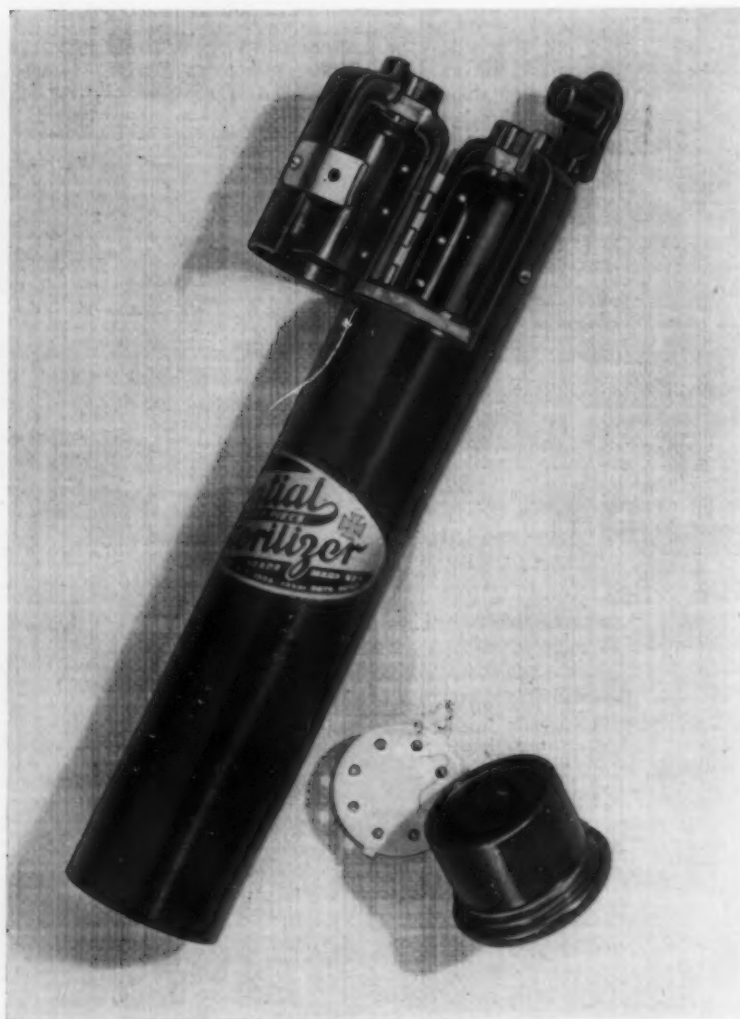
tic value, as well as being practical and serviceable for use in the home. Any combination of colors is attainable, and many beautiful effects were shown, obtained by skillful blending of tints. Souvelo ware was exhibited in the following forms: sweets dishes, ash trays, cigarette boxes, floating bowls, teapot stands, cake stands, trays, fruit dishes, and table mats. Grapefruit holder, powder bowls, etc., are in course of preparation. The material is hygienic, stainless and practically unbreakable. It was not shown molded into cups or other drinking vessels, as it has a

(Continued on page 229)



Plastics in Modern Dentistry

Another case where phenolic resinoid is put to work by the dental materials supply trade with good results.



Molded Drill Sterilizer

MOLDING materials of the phenol resinoid group have been in use for quite some time now for the manufacture of various articles used by the dental profession. It has been used for numberless articles from dental chair arm rests to plates for false teeth. And as in other fields, each successful application points the way to other uses, either for the manufacture of some new device or to replace some other substance which has been used for mak-

ing something long in use.

The illustration shows the Nemmers Sterilizer for dental drill holders. This was originally made of metal, which was not only heavy but required frequent polishing in order to keep it clean and bright. The instrument was enjoying a good sale because it was ideal for the purpose for which it was intended, a quick and efficient method of sterilizing drill holders.

However, as stated, it was

made of metal and required frequent polishing by the customer and this created a certain amount of sale resistance. This has been overcome by the use of molding material, as of course the instrument in its present form retains its original finish with little or no attention.

Casting around for some material other than metal, which would fill their requirements, the manufacturers took their problems to a molder. The result is that now the barrel, cap and threaded end piece are all molded. This entirely eliminated considerable lathe and milling machine work. In fact twelve separate operations were done away with. This, of course, reduced costs. Weight was reduced by fifty per cent. The need for frequent polishing by the dentist as well as expensive buffing operations during manufacture was also eliminated.

Advantages of Molding

To sum up the advantages obtained by molding, the manufacturer gets a better looking instrument that retains its color and lustre making polishing unnecessary; weight is reduced, and the final cost is reduced some 12½ per cent. Another factor of course is the time saved in fabrication. Every short cut from the raw material to the finished product means just so much capital released for other work.

In the face of all these advantages there is little wonder that we see this article in its present form.

This interesting job of molding is being done with Bakelite by The Chicago Molded Products Co.

Molding for Giants of Industry



These parts are made for many of the finest American automobiles. Makers of these cars have the utmost confidence that every SCRANTON molded part will give uniformly excellent service. This service is guaranteed by our experience, workmanship and equipment.

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SCRANTON, PA.

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645 Washington Boul., Chicago, Ill.

New York Office, 50 Union Square
Arthur F. Wiseburn, Manager

Ohio Representative, J. E. Black & Co.
The 4900 Euclid Bldg., Cleveland, Ohio

New Type Escutcheon Plate

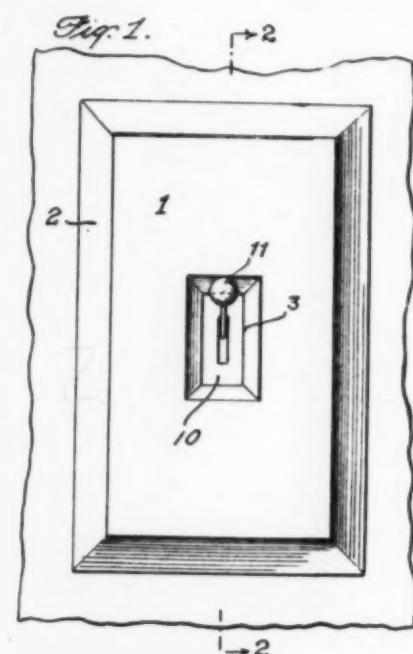
**Closefitting and easily removable plate
made possible by use of snap fasteners.**

THE big demand today in the building industry as well as in other industries is speed in construction combined with good appearance in the completed job. The ease with which any part can be assembled to complete the work on hand goes a long way to helping the contractor decide on its use. This new escutcheon plate should find a ready market because of the snap assembly feature which makes it easy to set up. This feature should also tend to increase the use of molded plates in that this method of setting eliminates any danger of breaking the plate in the setting operation.

THIS invention relates to escutcheon plates and more particularly to escutcheon plates which can be readily removed without extensive use of tools.

Escutcheon plates for wall outlets, and particularly for electrical outlets and switches, are made of metal or, in some cases, molded materials. They are usually fastened by means of screws passing through the escutcheon plate and engaging in tapped holes in the outlet box assembly or other analogous structure. This method of semi-permanent fastening is open to a number of disadvantages. In the first place, the plate is not readily removable as, in general, two or more screws must first be removed and this is quite a serious problem in many cases as escutcheon plates, particularly those covering outlets of base plugs, are frequently behind pieces of furniture or in corners where they are hard to get at and the removal by unscrewing is a difficult and disagreeable task and always entails the possibility of losing the screws.

As a result, escutcheon plates are practically never removed and, where they are made of metal or other material requir-



ing polishing, they are either neglected or polished on the wall which is likewise frequently a difficult and disagreeable operation and presents the danger of polish getting on the wall immediately surrounding the escutcheon plates. The screw-heads are also a source of ugliness and are particularly ugly in the case of escutcheon plates made of molded material, such as phenolic condensate compositions, and the like, which are usually colored. Escutcheon

plates of molded material are also liable to breakage by too great tightening of the screws as the plates are generally thin around the screw holes which must necessarily be countersunk.

Plates Fit Flat

Screw fastening escutcheon plates are also open to serious disadvantage, particularly in case of escutcheon plates of molded materials, in that it is difficult to mount them flat against a wall for the reason that outlet boxes, especially those of large dimensions for a plurality of outlets are seldom set perfectly true in the wall and any departure from true setting makes it difficult to fit the escutcheon plates flat or necessitates compensating for inaccuracies by causing the escutcheon plates to bend when screwed tight. In the case of molded material, this is very apt to crack the plate and even in the case of metal plates, the warping is a serious disadvantage. The time lost in fitting escutcheon plates is also very much greater where irregularity in outlet box setting must be compensated for.

Readily Removed

The principal object of the present invention is to remove the disadvantages inherent in escutcheon plates hitherto used and to provide an escutcheon plate structure and fastening means which permits ready removal of the escutcheon plate without loosening of screws or other permanent fastening and

(Continued to page 222)

AN ANNOUNCEMENT!

OF IMPORTANCE TO EVERY BUYER *of* MOLDED PARTS

AN entirely new organization opens its doors in Meriden, Conn. New in name and equipment, new in ideas and methods though old in experience. The heads of this organization have had years of development work in the greatest advance in the history of the molding industry.

Cold molded products with all the advantages of this type of work may now be obtained under our exclusive process in a wealth of beautiful colors and mottled effects.

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Investigate at once.

We will cheerfully furnish all information.

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CONNECTICUT MOLDED PRODUCTS CO.

MERIDEN, CONNECTICUT

Formerly with the Connecticut Telephone and Electric Co.

New Type Escutcheon Plate

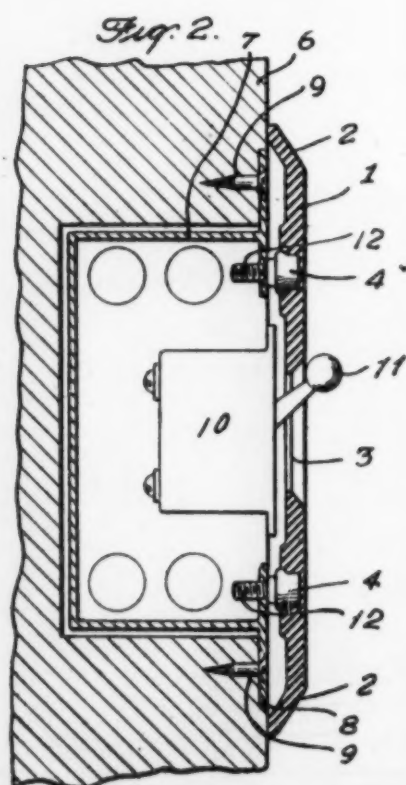
(Continued from page 220)

which does not tend to crack escutcheon plates of molded material. A further object of the present invention consists in the provision of escutcheon plates which are free from disfiguring screw holes.

With these and other objects in view, this invention comprises escutcheon plates and corresponding outlet box assembly provided with detachable fasteners so that the escutcheon plates may be removed by hand or with the aid of a flat tool to pry up the plate. Any fastening which is detachable by a pull, either straight or at an angle, may be used and will be referred to generically in the specification as "snap fasteners."

Snap Fasteners

The invention is illustrated by the following more detailed description of a molded escutcheon plate for a toggle switch provided with modified glove snap fasteners, but it



should be understood that the invention is not limited to the specific details set forth and other types of escutcheon plates and snap fasteners are included in the invention. Glove snap fasteners and similar fasteners, which permit the use of a screw threaded stud, constitute the preferred embodiment of the present invention and possess numerous advantages which will be apparent from the following description taken in connection with the drawings:

Molded Plate

Fig. 1 is a front elevation of an escutcheon plate mounted in place;

Fig. 2 is a vertical cross-section through the escutcheon plate and outlet box taken along the line 2—2 of Fig. 1;

Fig. 3 is a rear elevation of the escutcheon plate removed from the wall;

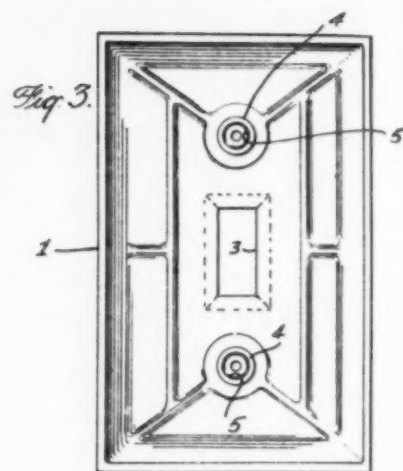
The escutcheon plate 1 of molded phenolic condensate is provided with the bevelled edges 2 which contact with the wall and provide sufficient clearance between the wall and the raised portion of the plate to accommodate the fastening means. A rectangular aperture 3 with bevelled edges is provided through which the toggle switch lever 11 projects.

Plate Snaps On

The escutcheon plate is further equipped with molded glove fasteners 4 of the usual type, containing spring rings 5.

The outlet box 7, carrying the switch 10, is mounted in a recess in the wall 6 in the usual manner, being held by screws 9 which clamp shoulders 8 against the wall. The outlet box assembly is tapped for the screws 12 in the usual manner but, instead of providing ordinary machine screws for fastening the escutcheon plate, fastening stud screws 12 are provided with slotted heads and spring caps conforming to the contour of the head and slot. The two studs are screwed in until their heads almost touch the shoulder of the outlet box, leaving, however, a

Molded Products




slight clearance for fine adjustment. The plate 1 is then snapped on to the fasteners and if it is not quite level and flush with the wall, the fasteners may be screwed in or out a sufficient amount to compensate for any uneven mounting of the outlet box. If desired, locking means, such as lock nuts, may be provided for holding adjustment of the fasteners but, in most cases, this is unnecessary as the fasteners are not subjected to any twisting strains. The escutcheon plate is finally snapped on flush to the wall as shown in Fig. 2 and can be readily removed and replaced either by hand or by the aid of a screw-driver or knife-blade to pry one of the edges. The escutcheon plate presents a perfectly smooth surface on the outside with no disfiguring screw holes or screw-heads showing and can be easily removed for replacement or cleaning.

No Strain

As the plate is not screwed tightly against the wall, it is not subjected to strain and there is little or no tendency for the molded plate to break. This permits the use of much more delicate materials which may be desirable for certain purposes and which have hitherto been impracticable, owing to their lack of mechanical strength.

This patent was issued Feb. 28th, 1928, to James B. Neal, Lockport, N. Y., assignor to Norton Laboratories, Inc., of Lockport.

G-E TEXTOLITE MOULDED



A New Source of Supply for Custom-Moulded Parts

Textolite Moulded is the name to remember whenever you want a permanent and dependable source of supply of custom-moulded parts.

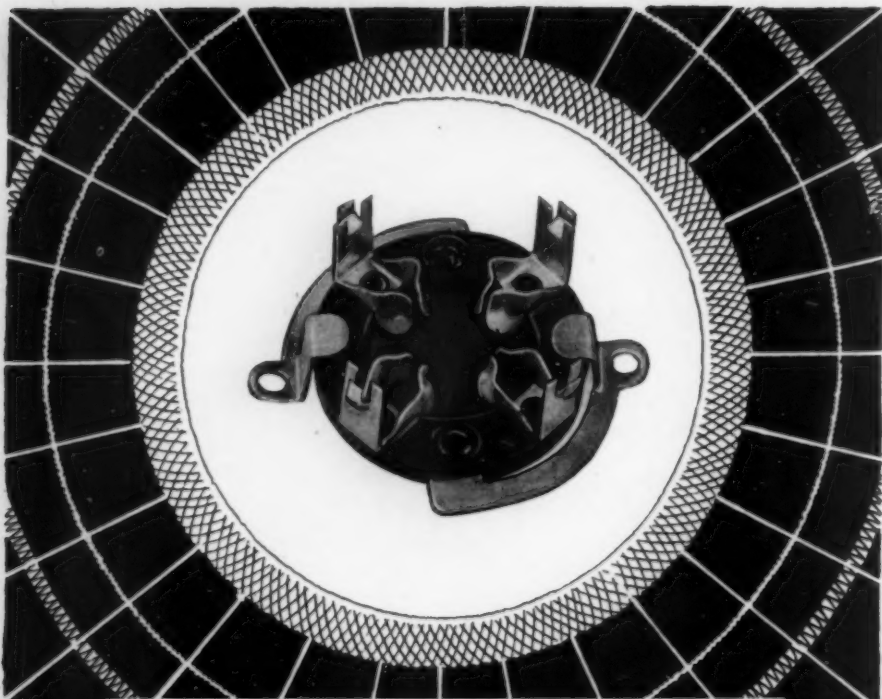
Here are shown a few of the large variety of intricate Textolite Moulded forms produced through the unlimited resources of General Electric's modern plants.

Purchasing agents are offered, in Textolite Moulded, that high quality which is typically G.E.; huge production facilities; a world-wide service; and all the economies resultant from scientific mass production.

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GENERAL ELECTRIC COMPANY, SCHENECTADY, N. Y., SALES OFFICES IN PRINCIPAL CITIES



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Mr. F. G. Scofield,
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8 Colborne St.,
Toronto, Ont., Canada

Molded Products

New Material Having High Mechanical Strength

There has been one problem that has taxed the abilities of the research laboratories of practically all the manufacturers of phenol-resinoid molding materials for quite some time. This has been to be able to produce a type of molding compound that would have all the good points of the regular type of molding powder and at the same time have a greater mechanical strength. By this is meant the ability to stand up under hard knocks and not crack under sudden strain.

Experimental Work

The research workers of The Colasta Co. of Hoosick Falls, N. Y., in trying to work out this problem at first conceived the idea of working in extraordinary long fibrous fillers in connection with the resin base. The resultant material was entirely satisfactory in so far as mechanical strength was concerned, however, the process for manufacturing this type of material was so costly that its use in this form was prohibitive. While it was true that the increased mechanical strength received was great enough to warrant its use on some jobs, at the same time it could hardly be considered of commercial value.

After considerable more work along this line this company has in the past three months put on the market a new type of material under the trade name of Herculite which they claim has solved their problem. This material is now being used for a number of purposes where strength is essential. It is being used for handles of all sorts, rocker arms for electric motors, frames for welding and chipping goggles, etc.



WARNING!



Are you aware that many irresponsible moulders of phenolic and synthetic materials (too numerous to mention) in order to make low prices on their products are resorting to the use of cheap adulterants to such an extent that the primary characteristics of great resistance to physical strain and shock, high heat and electrical insulating qualities as found in the basic material is so impaired that the duped customer might as well purchase shellac or other gum compositions and save money.

*Let us quote you very interesting prices
on high grade natural gum compositions*

**Don't Be Duped
Use Siemon Parts
As Made By**



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The Siemon Company
Bridgeport, Conn.

The Watertown Manufacturing Co.
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The American Composition Co.
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The Specialty Insulation Mfg. Co.
Hoosick Falls, New York



JEWEL ELECTRIC INST. CO.

PARTS MOULDED OF BAKELITE
by **SCHNEIDER**



The intricacies of these Jewel Electric molded parts and the exact perfection of their details are fair ideas of what to expect when ordering your molded parts from

SCHNEIDER ELEC. & MFG. CO.

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Trade Moulding Exclusively

Molded Products

NEMA Meeting

IT has been said that trade associations are of value in direct ratio to the extent to which each and every member is willing to forget self in order to advance the condition of the industry as a whole. If this be true, and there is little room to doubt its truth then the Molded Products Section of NEMA is bound to be a "howling" success.

This association which was organized January 26th as reported in the February issue of PLASTICS held a meeting on April 4th at the NEMA offices in New York. The meeting was attended by all the members and two new members were received into the association, The Chicago Moulded Products Corp., represented by Mr. Edw. F. Bachner and Schneider E. & M. Co., represented by Mr. G. E. Schneider.

The program of the meeting was as follows.

10:00 A. M. Executive Committee Meeting, NEMA Office.

12:30 P. M. Lunch of Section Members and Guests, NEMA Office.

2:00 P. M. Section Meeting.

1. "Cost Finding Methods in the Moulding Industry," F. H. Corregan.

2. "Recommendations Regarding Trade Practices in the Industry," B. E. Schlesinger.

3. "Recommended Plan for Obtaining Generic Name," W. H. Kempton.

4. "Action on Recommendations that Reports be Collected on Closed Business Transactions," E. H. Ott.

5. "Action on Recommended Equalization of Traveling Expenses to Meetings," Prescott Huidekoper.

6. Election of Secretary.

7. Other matters.

6:30 P. M. Moulded Products Dinner, Tavern Room, Hotel Commodore.

8:30 P. M. Theatre Party.

Cost Finding Methods

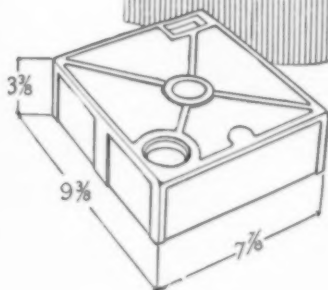
The subject which caused the most discussion and which really

(Continued on page 228)

PLASTIC MOLDING



Bakelite Motion
Picture Camera
Box, moulded by
Shaw



*I*F YOUR JOB is one that requires expert craftsmanship, if your molded parts must be perfectly made and finished to the highest degree of accuracy, it will pay you to consult Shaw.

In other words, if your first consideration is to procure quality molding you need a quality molder.

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AT

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Molded Products

NEMA Meeting

(Continued from page 226)

resulted in bringing the various members closer together than any other was the first paper on "Cost Finding Methods in the Moulding Industry." This paper was the result of a request for bids on a certain piece sent out by the association to the various members. Each member entered his bid in the same manner as though he were bidding on an actual job. These bids were then entered in the records (kept unidentified of course) and then spread before the members at the meeting.

These bids varied widely in price. It was of course recognized that some members would have a lower cost on this type of work than others but this in itself could not account for the wide variation. After much discussion it was plain that what was needed was an efficient method of cost accounting by some of the members. This matter will be taken up in more detail at the next meeting.

Generic Name

It was decided at the meeting that members of the association would respect the Bakelite Corporation's right to their trade name would in no case use the word Bakelite as a generic term. The committee in charge of this question headed by Mr. W. H. Kempton was instructed to go into this matter in detail and report at the next meeting.

The next meeting is to be held at Hot Springs, Va. the week of June 11th.

The interesting part about this meeting was the way in which all the members without exception seemed to be working together for the interest of the industry as a whole. The problems confronting the molding industry in an association of this nature are many and varied but the way in which the various members are going at the matter is proof that they will eventually be solved to the lasting benefit of all concerned. And this means the buyer of molded parts no less than the molder.

Molded Products At British Fair

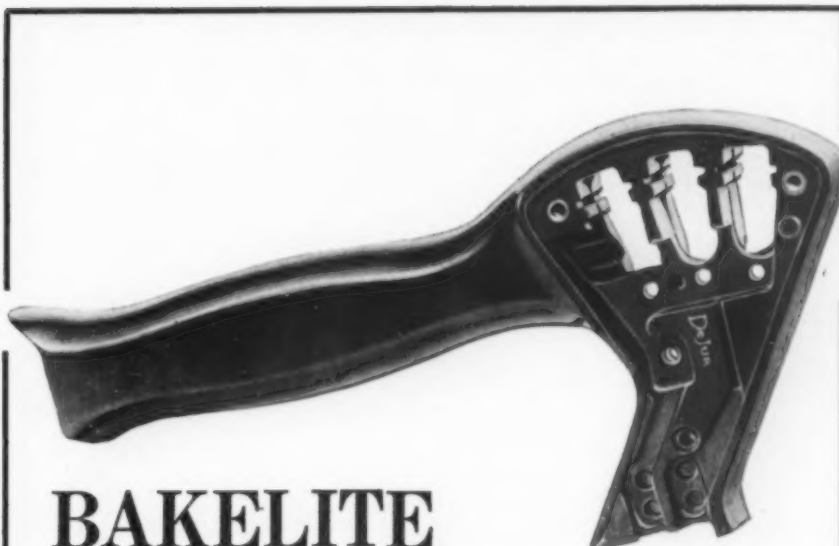
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tendency to flavor hot liquids. The firm has, therefore, wisely refrained from manufacturing these lines.

"Elo" products occupied the stand of Birkbys, Liversedge, Yorkshire, specialists in radio moldings, dials, tube-holders, and coil plugs. "Elo" is a synthetic resin condensation product, evolved and patented after much research and experimental work and manufactured throughout in Birkby's own works at Liversedge. It meets the demand for a high-class heat-resisting insulation and it is claimed that it has points of superiority over any imported material of its class. Although there are many insulations possessing some of the Elo qualities, the makers claim that no other in existence combines all its good points. Although developed primarily as an insulating material for electrical use it is suitable for many classes of purely mechanical work where a really high-grade material is required. Its sphere of usefulness is still further widened by the fact that it is supplied in the form of moldings, molding powders, insulating varnish and resin. All its distinctive qualities are present in each form.

For all electrical accessories Elo is suitable, and the manufacturer's customers include practically all the leading electrical concerns in the United Kingdom. Elo is being used to an increasing extent for radio parts. But besides its electrical uses it is winning favor in purely mechanical jobs. It has been found satisfactory for such diverse articles as bell fittings, telephone ear and mouth pieces,

Story on
Molded Gear
Shift Balls
in an Early Issue.



BAKELITE PRESSING-IRON HANDLE

This intricate molding, held to the closest limits and produced without interruption or variation, is an example of

The Precision Production
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Anything Molded of Bakelite



*A few interesting small parts
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QUALITY & QUANTITY MOLDERS

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Molded Products

motor horns, steering wheels, tank caps, lever handles, adding machine parts, dental tools, instrument and camera cases, and typewriter parts. In fact, its use has simplified many difficult jobs. Two great features are the fact that it can be molded to very exact dimensions, and that it has no injurious effect on metal inserts.

Although Elo has numerous uses, it should be remembered that its price and quality make it unsuitable for cheap work and that, special molds being expensive, from an economic viewpoint the quantity should be adequate.

Birkby's both supply Elo in powder form and as molded products. All the resources of its experimental laboratory are placed at the disposal of manufacturers who buy the powder for their own moldings. A special grade of Elo is produced for jobs where greater strength or heat-resistance is required.

Elo Variegated Ware

Elo variegated ware was the newest product shown by the firm. This is a product possessing all the brilliance and beauty of the finest pottery or porcelain. It is much stronger, however, and, with ordinary handling, practically unbreakable. It is light in weight and has a bright, durable polish which is unaffected by heat or damp. It was displayed in many beautiful color combinations in a variety of shapes and sizes. The smooth surface is absolutely hygienic and can be used with perfect safety for all kinds of fruit or foods. The fact that it cannot burn, fade or lose its colorings in the course of being washed render it a ware with utilitarian purposes equal to its ornamental uses. A point of interest to home lovers is that any color scheme or design can be produced specially to the customer's requirements, allowing scope for a display of desirable individuality in the modern home.

Elo variegated ware products were shown in the following forms: trays, fruit stands,

finger bowls, floating bowls, puff boxes, hair brush backs, dressing table pieces, tooth brush handles, table mats, photograph frames, clock cases, ash trays, cigarette cases, candlesticks, panels, advertising novelties, boxes for cigarettes, cards, etc., plates, tobacco jars, knife handles, etc. Cups and saucers were also shown, but it is understood that these are still in an experimental stage.

Casein Products

A very elaborate display of manufactured articles in erinoid and birmite was featured on the stand of E. Elliott, of Birmingham. Erinoid products shown included manicure stands, reading glasses, dress hangers, and numerous novelties for fancy goods stores, stationers, druggists, and cigar stores. A special erinoid line was a folding garment hanger, packed in twos or threes in fancy presentation cases. The hanger folds for packing when travelling and is easily extended, being firmly held in position by a patent fastener. Rubber inlays prevent the garment from slipping off, making the hanger especially suitable for artificial silk wear. Erinoid manicure sets were made up in single and layered colors. The designs were distinctive and the stands for holding the instruments in each set were well constructed and had the high finish obtainable on high grade erinoid products. A variety of birmite molded articles were also shown in attractive colors.

Toilet Articles

Brush sets, shingle sets, mirrors, manicure stands, powder bowls, napkin rings, coat hangers, combs, and numerous novelty lines were the principal features of the exhibit of British Ivric, Ltd., Tottenham, London. This firm, which specializes in casein products, was patronized by Queen Mary on her visit to the Fair. Her Majesty made purchases of a number of manicure sets, bowls, and other boudoir table articles at this stand, which incidentally featured

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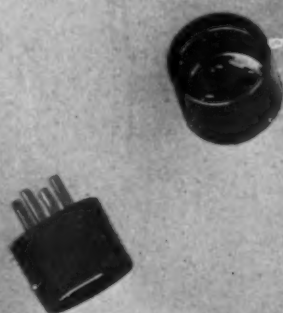
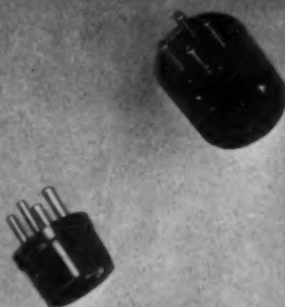
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The exhibit of Cascelloid, Ltd., Leicester, contained practically every description of article in celluloid and erinoid, including toys, fancy goods, druggists' sundries, photo frames, wind-mills, rattles, advertising novelties, etc. This firm offers to make any article in these materials to customers' requirements. Many of the lines it makes are new to England, having hitherto been imported almost entirely from Germany or Japan.

Presses at Work

The Aberdeen Combworks, Ltd., Aberdeen, which is the largest comb manufacturing concern in the world, had a comprehensive exhibit comprising combs of every description and for all markets. The firm specializes in keronyx non-inflammable combs, and also makes paper cutters, drinking cups, shoe horns, etc. Keronyx is its own non-inflammable substitute for ivory, but it also manufactures on a large scale vulcanite, celluloid, xylonite, etc.

Two stands were occupied by the Beetle Products Co., Ltd., Oldbury, one of which is seen in the accompanying illustration. In the other stand molding machinery had been installed and the public was actually able to see molded articles being made in the Fair. This firm manufactures colorless transparent synthetic resins, white and colored molding powders for producing electrical and decorative moldings, and durable tableware in delicate and translucent effects. The lightshades used in the illumination of the stands (see illustration) are all molded from Beetle powders.

New Molding Powder

This firm took advantage of the Fair to introduce two new products, namely, a new standard black molding powder, and "Infuselax" varnishes and enamels. The reason for the introduction of this new molding powder, which has already been described in PLASTICS, was to enable molders to standardize their moldings conditions. Mold-

ers who had sufficient work for several months in the year producing articles from Beetle colored powders are enabled by it to continue molding with the lower-priced black powder under exactly similar conditions.

Products made from Beetle molding powders are now known as Beatl ware, which name all companies holding manufacturing licenses granted by Beetle Products Co. are entitled to apply to their productions. It has been necessary to change the spelling in the case of the finished articles in order to conform with the laws governing the granting of trade marks, Beetle Products Co. having found that by allowing such articles to be styled "Beetle ware", it was in danger of losing the copyright in its trade mark. "Beatl" is thus now available to the public under the trade name of "Beacon," "Bandalasta," and "Endura" wares, which are now obtainable at the leading department stores throughout Great Britain and also at all branches of W. H. Smith & Son, the world's largest chain of news and stationery stores.

Washed Like China

Beatl ware possesses the beauty of porcelain, is far lighter than china and much more durable. Cups and saucers, plates, bowls, fruit dishes, etc., can be obtained in almost every color, besides in translucent marbled shades. It can be washed with soap and water like ordinary china, but the use of soda or washing powders containing strong alkali is not recommended. Ash trays are not made of the material as, although practically fireproof, it has a tendency to char. It has, however, been more used for cups than any other molded ware shown at the fair, being tasteless even when holding boiling liquids. A cooperative sales agency has been established in London for Beatl wares and a national advertising campaign has been embarked on in order to familiarize the British public with the name "Beatl" and the products to which it applies.

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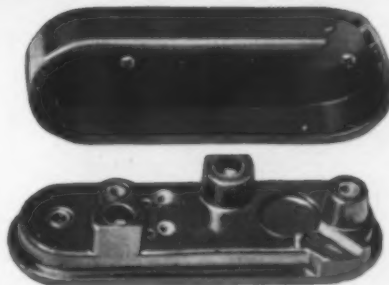
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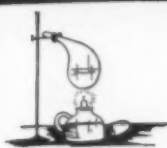
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

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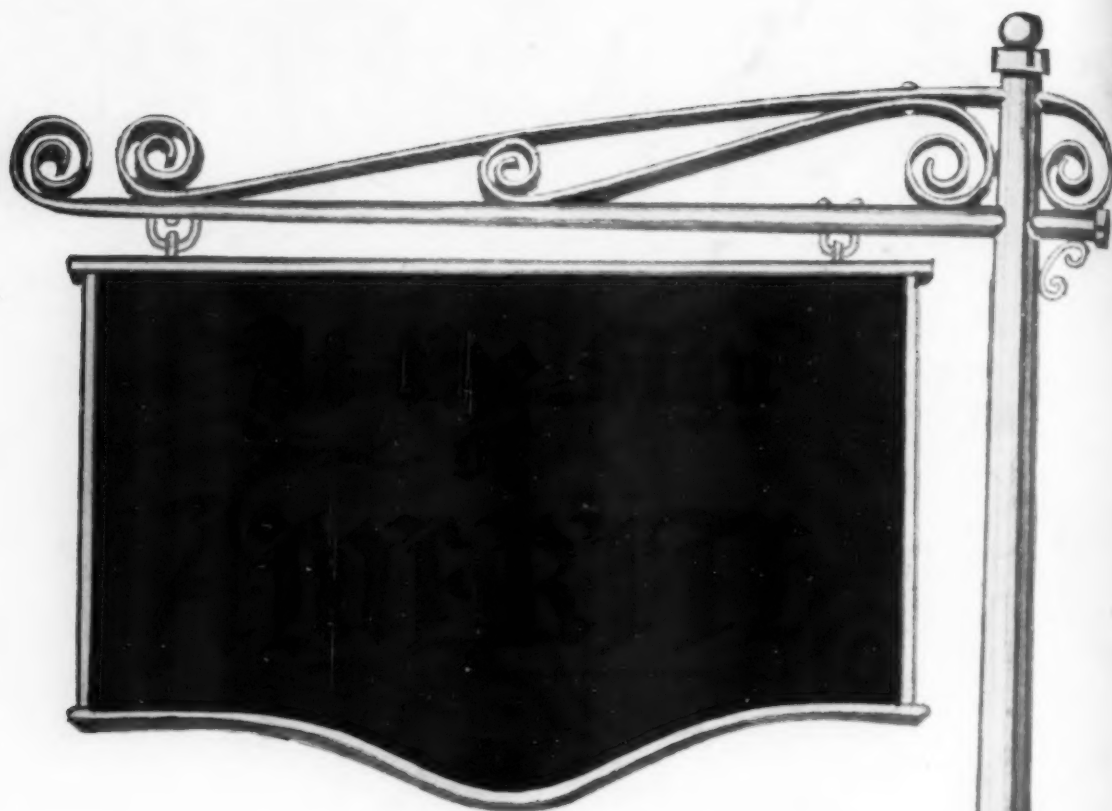
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